amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

VOL. 48, No. 8 AUGUST 1980

FEATURED IN THIS ISSUE:

- ★ *How Your Favourite 5/8 W-L Antenna Doesn't Work*
- ★ *Two Metre Linear with a Difference*
- ★ *Amateur Radio for the Cruising Yachtsman — Part 2*
- ★ *John Moyle Memorial Field Day Contest, Results 1980*
- ★ *Equipment Review: The TenTec Omni D Series B Transceiver*

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Entries close at 5PM on Monday, 3rd November, 1980. Entries received after this date will not be considered.

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Cover Photo

Pictured this month is Peter VK3BEJ, President of the Mildura Amateur Radio Club. The Club is active in the Sunraysia District and also enthusiastically participates in WICEN exercises as far afield as the Wimmera. Amateurs contemplating a trip to the Mildura district will be heartily welcomed by the friendly amateurs like Peter.

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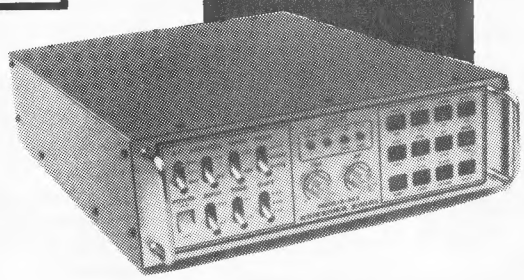

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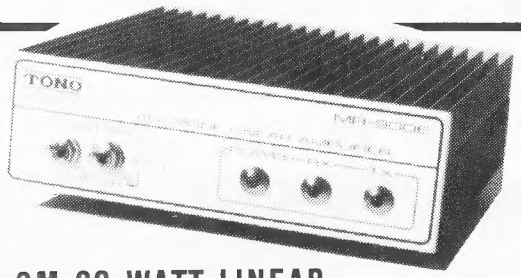

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QSP —

ARE YOU A MINE OF MISINFORMATION?

How often do you hear amateurs complaining about some aspect of our hobby or knocking the work being done by others?

Amateurs, it has been said, are amongst the world's greatest moaners; I prefer to think not!

The very nature of our hobby is such that our views can be easily communicated to others albeit as a "knee jerk" reaction perhaps to an ill-informed comment by another.

It is disturbing enough to overhear two amateurs debating an issue based on a false premise. It is even more disturbing to hear an amateur, who is a member of the WIA and therefore should be better informed, leading a number of fellow amateurs up the proverbial "garden path".

Keeping up to date with Institute activities and policy can be a time-consuming task. Our hobby is a most complex one requiring on the individual's part a knowledge of technical, operating and regulatory matters together with an overview of international aspects.

The Institute, since its inception, has been involved (if not the iniator) in most facets of our hobby, both national and international. By way of example, I have picked at random some of the matters dealt with by your Federal Council over the past three years:

- **Novice extension to 80 metres**
- **Beacon licensing conditions**
- **P. and T. liaison**
- **FM repeater licence conditions**
- **70 cm band plan**
- **Channels 0 and 5A**
- **WARC 79**
- **CB effect on the amateur radio service**
- **Handbook revision**
- **Examinations**
- **Intruders in our bands**
- **Amateur Advisory Committees**
- **Amateur Radio magazine**
- **Electromagnetic compatibility**
- **WIA broadcasts**
- **Microwaves**
- **Customs duties**
- **Video tapes for use by clubs and others**
- **Long term plans for amateur radio in Australia**

This is by no means a comprehensive list — the point is that the Institute is involved in a diverse range of matters. A glance at the list of names in the Federal directory will verify this and this list does not include the many amateurs involved at the Divisional level.

How, you might ask, can you keep up to date? Ideally by becoming involved. This of course is not always possible, in which case I would recommend that you remember the following:—

1. **A precis report of the Federal Convention proceedings is published each year in AR — usually the July issue.**
2. **Read WIANEWS and QSP in AR each month.**
3. **Buy yourself a copy of the new P. and T. Regulations Handbook and bring yourself up to date.**
4. **Remember the Call Book contains a lot of additional information, including band plans, beacon and repeater licence listing, awards, etc.**
5. **Listen to your Divisional weekly broadcasts for the latest news and happenings.**

You can see that, as a member of the Institute, you should be fully informed and, further, you should be in a position to help others — especially newcomers. Please do not be associated with the following quotation made by an American novelist, Jack Kerouac — "I have nothing to offer anybody except my own confusion".

73
P. A. WOLFENDEN VK3ZPA/NIB,
Federal President. ■

AFTERTHOUGHTS

For those contemplating building the "Spectrum Scanner" — by Winston Nickols (page 11, June AR), Murphy advises the following:

1. **A 12 volt rail supplies the "low-band — high-band" switch and the output from the switch is applied to the tuner** — not as shown.
2. **The P.U.T. is a BRY39** — not as shown. ■

QSP

10 MHz BAND

"Amateur Radio's new 10 MHz band should be limited to CW only the IARU R1 Executive Committee agreed at its London meeting, to provide minimum utilization of the shared 50 kHz allocation when it becomes available January 1, 1982. Strong support for an all CW '30 metre' band has also been registered by US amateurs who have written ARRL headquarters on the subject, with only a small minority advocating setting aside sub-bands for other modes."—Ham Radio, April 1980. ■

REPEATERS

There are now over 110 licensed repeater stations in the U.K., Rad. Comm., April '80. The RSGB is the licensee of all the U.K. repeater stations and is responsible to the licensing authority for all aspects of repeater licensing and operation. ■

EXAM STATISTICS ELSEWHERE

Radio ZS of Jan. '80 reports receiving advice from their licensing administration about the November 1979 examination. There were 649 applications and 514 sat the exam of whom 45.14% passed, the highest aggregate being 87.5% pass rate and the lowest 5%. The Institute is still trying to obtain something similar for Australia. ■

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WIANEWS

Licence fees are up from 1st July — full and limited from $12 to $15, novices from $6 to $10. In case you missed this news item on broadcasts, etc.

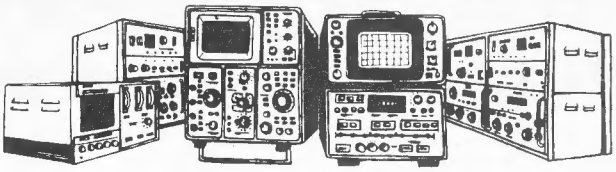
The Executive carried out a feasibility study of issuing the 1981 Call Book to all members and decided this was not feasible. The possibility of the Federal dues for 1981 being increased for this reason therefore falls away. The Publications Committee strongly favoured 12 issues of AR each year and this was accepted by Executive.

At an Executive meeting on 19th June Mr. Bill Roper VK3ARZ accepted nomination to fill the vacant position on the Executive in abeyance from the 1980 Federal Convention. It was reported that the VHFAC were preparing a draft band plan for 23 cm so that it can be published for comments.

The Executive supported the efforts being made by the Federal Awards Manager to untangle the situation relating to the VK0RM contacts made from Heard Island.

An incident was reported in Victoria late in June when a licensed amateur was said to have replayed a video recording of a commercial TV programme over an ATV repeater.

In Victoria it is observed that novice licences in the suffix series PAA-PZZ are being issued. ■



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John Moyle Memorial Field Day Contest, Results 1980

24 HOUR DIVISION

Section (A): Portable Field Station Transmitting Phone.

VK5CCT	5481	VK3APZ	431
VK4NFU	2638	VK4VX	420
VK3NZM	2422	VK4AAQ	420
VK2VNP	1910	VK4ADB	420
VK4XZ	1390	VK4ARH	420
VK5NNC	1309	VK4NDX	360
VK6TJ	1109	VK4NHS	360
VK2BDT	594	VK5ABS	202
VK5NTV	456	VK4NLV	80
VK4AHO	440	VK4NDW	60

Section (B): Portable Feild Station Transmitting CW.

VK5ZE	544

Section (C): Portable Field Station Transmitting Open.

VK5OR	2272

Section (D): Portable Field Station Tx Phone Multi-operator.

VK4WIZ	12321	VK1ACA	3190
VK2MB	7690	VK5ACE	2861
VK3BGG	5008	VK5LZ	2758
VK4ARZ	4025	VK5PP	1931
VK4WIP	3893	VK4WIM	1919
VK3BML	3501	VK2BNR	997
VK3XK	3230		

Section (E): Portable Field Station Tx Open Multi-operator.

VK3ATL	17046	VK4WIT	5701
VK3APC	11936	VK5SR	5368
VK2DBK	10070	VK7NB	3055
VK2WG	9650	VK3AWS	3028
VK3ATM	9580	VK5VE	2945
VK3ANR	9437	VK5WC	2899
VK8DA	6068	VK5ARC	2512

Section (F): VHF Portable Field or Mobile Station Tx.

VK3XQ	2214	VK4ZRQ	300
VK3ZJS	1504	VK2DBA	74
VK2BNR	398	VK1LF	66

Section (G): Home Transmitting Stations.

VK3XB	1850	VK3AEW	1260
VK3KS	1405	VK7NFR	255

Section (H): Receiving Portable or Mobile Stations.

L40804	Nancy Heaton	1475
L40018	Charles Thorpe	495

6 HOUR DIVISION

Section (A): Portable Field Station Transmitting Phone.

VK3VKZ	1335	VK4NBW	506
VK2BTZ	1152	VK3AKJ	435
VK3SP	1022	VK2DCW	379
VK5MX	1009	VK3YRP	320
VK1RP	929	VK2BUT	307
VK5AIM	859	VK5NEB	215
VK2VWH	690	VK2NMK	200
VK3HE	678		

Section (B): Portable Field Station Transmitting CW.

VK3TX	558	VK2JM	504

Section (C): Portable Field Station Transmitting Open.

VK2EL	1249	VK2VUT	569
VK4UX	916	VK3VF	509
VK1DL	820	VK2GT	250

Section (D): Portable Field Station Tx Phone Multi-operator.

VK4WIN	3152	VK4NLX	1161
VK3ATO	2392	VK3BRL	1157
VK3BTH	1980	VK3CAU	936
VK5KR	1675	VK2BSU	518

Section (E): Portable Field Station Tx Open Multi-operator.

VK3ABP	1608

Section (F): VHF Portable Field or Mobile Station Tx.

VK3AVJ	648	VK2EL	94
VK3YIW	576	VK2ZQC	40

Section (G): Home Transmitting Stations.

VK3ZI	645	VK4VOJ	160
VK5OU	600	VK2YGL	120
VK2BQS	560	VK4VCE	45
VK4LT	455		

Section (H): Receiving Portable or Mobile Stations.

L60036	P. K. Dean	1077
L50505	Robert Dayman	460
L30042	Eric Trebilcock	260

Check log from VK1CC.

RESULTS OF THE 1979-80 ROSS HULL MEMORIAL CONTEST

Outright winner of the trophy is Ray Naughton VK3ATN.

Section (A): Transmitting Phone.

Call Sign	7 Day	48 Hour
VK2BYX	1244*	604
VK2BYX	720	316*
VK2BQN	578	284
VK2HZ	602	246
VK2YEP	238	80
VK3ATN	3320	1402
VK3YLD	1214	392*
VK3AUI	900	383
VK4DO	2242*	768
VK4ZNG	1719	724*
VK4ZTV	596	262
VK4ZCO	264	84
VK5LP	944*	442
VK6OX	422*	152

* After a score denotes a certificate winner. ■

How Your Favourite 2m 5/8 W-L Aerial doesn't work

Rodney Champness VK3UG
31 Helms Court, Benalla, 3672

Having firmly kicked that sacred cow, the 5/8 wave aerial, saying that it doesn't work, I had better come up with some good hard facts, or expect to be excommunicated by all its believers. Until about 12 to 18 months ago, I too had been a firm believer in the statement that a 5/8 aerial had a gain of 3 dB over a 1/4 wave. Well, it does have a gain of 3 dB over a 1/4 wave, but not often in the direction that you want it to have this gain — and this is the crux of the story.

I have become most interested in aerials and getting the best performance out of them. I decided to do some experiments with vertically polarised 2 metre groundplane aerials. I made up a quarter wave groundplane radial system and placed a mobile aerial base in the centre of it so that I could quickly connect and disconnect the aerials that I was about to try. The radials were at 90 degrees to one another and horizontal. The aerial base was connected by a short length of coaxial cable to a detector circuit as shown in Fig. 1. The output from this goes to a sensitive multimeter with several dB ranges marked on the meter face. The aerial base was mounted at a height of about 2 metres on a pole.

A signal source of about 10 watts was set up on a frequency of about 146.3 MHz (one not in use) at a distance of a few wavelengths from this test aerial. The signal source fed a 1/4 wave aerial although possibly a more directional aerial at the signal source may have made the job easier. The transmitter was placed on air and suitable identification used as per P. and T. requirements.

With the 1/4 wave aerial attached to the groundplane, it was tuned for maximum reading on the dB meter. This was then considered 0 dB or reference. The radials were then bent down to obtain a better match and at 45 degrees droop the gain had risen to +1 dB, and the 1/4 wave was also probably better matched into the 50 ohm cable. The next experiments was to tune up the 5/8 aerial on the same groundplane with drooping radials. The maximum gain was —1 dB (????). I then tried my Hustler CG-144 aerial which is a rather large monster being over 2 metres long. I was able to obtain a gain of +4 dB, not the 5.2 dB that the literature would have you believe.

I now tried tilting the various aerials towards and away from the signal source and obtained some interesting results. The 1/4 wave stayed much the same in performance with moderate tilt and then dropped off with increasing tilt. The Hustler immediately dropped off when tilted towards the signal source but did show a 1 dB rise in performance when tilted about 10 degrees away from the signal source. The 5/8 showed a further drop when tilted away from the signal source but came up to between +2 and +3 dB when tilted about 30 degrees towards the signal source.

So now it is obvious what is happening, the 5/8 aerial used on a 1/4 wave groundplane does not have its radiation along the horizon but at an angle of 30 degrees ABOVE the horizon. This finding has not been mine alone. In fact at about the time I was doing these experiments I read an article in Practical Wireless for April 1978 by F. C. Judd G2BCX on the "Slim Jim" 2 metre aerial. I would commend this article to you. The "Slim Jim" appears to have a quite reasonable following who are very happy with its performance. I didn't have a "Slim Jim" made at the time of these experiments so no comparison has been made. Naturally the 5/8 aerial would be quite a good performer if you live in a valley with hills all around and the stations you wish to work are high up or over the hills. It is also suitable if you tilt it to work as a one element beam with a few dB of directivity.

The tests above were repeated using a weak signal source a couple of kilometres away. This time the detector was my receiver with a Hewlett-Packard 1 dB per step attenuator in the aerial line. The system was set up with the S meter reading a convenient level with the attenuator set to about half attenuation. The test aerial base this time was above the house. The 1/4 wave, 5/8 and Hustler CG-144 were tried alternatively using only the drooping radial system. Using the 1/4 wave with droopy radials as the 0 dB standard, the Hustler gave +3 dB and the 5/8 —3 dB. Comparing the 1/4 wave with horizontal radials these would have been Hustler +4 dB and 5/8 —2 dB. Once again the 5/8 did not show up at all well; the Hustler was consistent with previously measured figures.

The next series of tests were conducted in a similar manner with the aerials mounted on top of a car with the base mounted through the centre of the roof. These were line of sight tests (nominally), in other words the whole of each aerial was above any surrounding obstructions. The 1/4 wave was again used as 0 dB reference, the Hustler gave +4 dB (consistent with previous measurements) and the 5/8 aerial gave +1 dB, which is an improvement over previous measurements. You might ask why the 5/8 showed this improvement in this case. The reason is that the aerial has a much larger groundplane. The groundplane size for a 5/8 to work with a low angle of radiation is at least a 1/2 wavelength radius; I suspect it is larger. Information on this is contained in the excellent book "The Amateur Radio Vertical Antenna Handbook" by Captain Paul Lee K6TS (published by COWAN, a "CQ" Technical Series). I would also commend for your reading September 1979 AR, the equipment review on a UHF aerial and the comments on mounting aerials, page 16.

Many will say that their 5/8 aerials work better than a 1/4 wave and no doubt some do. I suspect the reason for this is that the aerial is physically higher than the 1/4 wave when mounted on a vehicle, and this applies to the Hustler even more so as the tip of this aerial is about 3.6 metres above ground level on my vehicle. As the height of the aerial is increased it will naturally clear more of the surrounding fences, people, and other low obstructions which attenuate the signal, so this in many cases is how the 5/8 and the Hustler get their apparent gain figures which exceed pure line of sight figures. With the 1/4 wave (its tip height on my vehicle being 1.8 metres) the radio horizon is 5.5 km away and for the 3.6 metre aerial tip height the radio horizon is 7.7 km away, under smooth earth conditions.

A few other problems also rear their ugly heads for the mobile operator to contend with; the main one is bending of the aerial with speed. The aerial when bent back will have its radiation pattern altered; in the case of the 5/8 behind-the-car performance will be enhanced, and in front seriously degraded. With the Hustler the reverse happens, and with the 1/4 wave being so small and rigid with a fairly broad doughnut shaped radiation pattern no

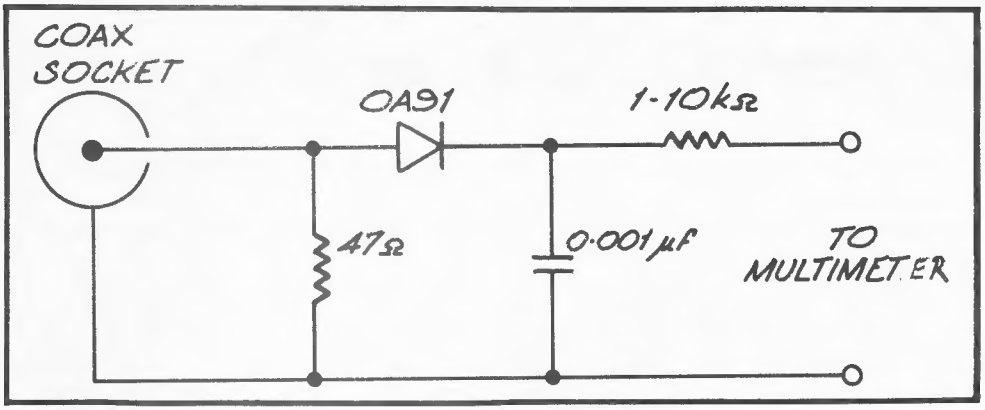

FIG. 1: Mount resistor, diode capacitor on the coax socket with minimal lead length.

variation is usually noted. How do we overcome these problems? We make the aerial as rigid as possible so that it stands up straight. This can be achieved at least in part by tying nylon fishing line to the aerial a fair way up and anchoring it to the vehicle guttering near the windscreen. You will have to make your own decisions on how to stop the line slipping on the aerial but perhaps insulation tape would do it. This will tend to stop some of the flutter that mobile signals often have, although just movement of the aerial isn't the only story. During my experiments I flicked the whips around and found that moving the ¼ wave about had very little effect on the gain figures obtained, the Hustler varied a bit and the reading for the ⅝ fluctuated violently even when the aerial was only flexing a few centimetres at the tip. I might add I use either a ¼ wave or the Hustler CG-144 when mobile. If I want extra range I use the Hustler.

The mounting of your aerial on the vehicle is important; it is to me as I work repeaters usually at the limit of their range. Aerials mounted on gutter mounts or on ski-bars or mudguards rarely work efficiently, for a simple reason — they don't have effective groundplanes. The ski-bar mount can, however, be made to work quite efficiently comparatively speaking. The ski-bar mounting is improved markedly by putting two 51 cm radials pointing fore and aft from the aerial base on the ski-bar. Slope them downwards but clearing the roof and the aerial should work considerably better. Unfortunately it doesn't look very attractive and your wife may dislike this.

Another thing that often causes mobile reception to be poorer than it might be is the ignition and other noise generated by the vehicle. Suppression methods described in articles in AR for January and March 1975, July 1976, February 1977 and April 1978 will help with this problem. Don't get the idea that FM transmissions are not affected by ignition interference — they are and your effective communications range can be reduced by up to 50 per cent.

Good luck and effective mobileering.

COMMENT

For central roof mountings on medium-sized station wagons careful tests made by Lew VK1ZLW and myself showed that the ⅝ had a gain of about 4 dB with respect to a ¼ wave. We also confirmed that a ½ wave vertical was 3 dB better than the ¼ wave, and that its performance was essentially independent of the groundplane. A gutter mounting was as effective as central mounting.

Radials are very efficient in preventing RF current flow along the outside of the coaxial line, an event that can make the antenna almost useless. Bending the radials of a groundplane to provide a match for the ¼ wave would put them in a less than optimum position for the ⅝. As the bottom of the Hustler CG-144 is an end fed ½ wave it should be less dependent on the groundplane than either the ¼ wave or the ⅝.—VK3AFW. ■

A Multi-Band Mobile Antenna System evolved from the Junk Box

I received delivery of a bargain-priced Yaesu FT-7 transceiver just prior to going north in my Ford Transit Campervan on holiday in June 1979. I looked around for some quick way to install the unit and FL-110 companion amplifier in the vehicle and provide it with some form of mobile aerial system capable of working most HF bands.

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Being in possession of one of those six feet long fibreglass car radio whips and mudguard mount I decided to try it out on HF with a home made antenna matching device that I use with a long wire at the QTH.

This combination worked well enough to provide contact on most days at lunch-time on 40 metres from wherever we were in Queensland back home to the Blue Mountains of NSW with my first harmonic VK2AVW operating from that end, and at other times on 20, 15 and 10 to various parts of the world.

However it soon became apparent that, although the antenna matching device was effective, its physical size mounted against the firewall near the passenger's feet (XYL) became a source of annoyance because of the foot-capacity effect detuning (same as hand-capacity but the other end), which on transmit invited a zap to the XYL's big toe with consequent rise in SWR and operation of the FL-110 amplifier's automatic final protection circuit! This situation could only be suffered until I arrived back home. What to do then? Why, formulate specifications of course.

1. Total enclosure of transmatch device in a metal box (saves zap to XYL's toes or anything else for that matter).

   ☐
2. Ease of adjustment with one control on all bands (the home-brew transmatch has three controls so four hands are needed on tune up).

   ☐
3. Able to handle full power SSB from FL-110 without flashing over.

   ☐
4. Small as possible physically.

There are many possible combinations of inductance and capacitance which when connected together will match a short vertical radiator to the transmitter with minimum SWR on most HF bands. I set out with a roller inductor and various combinations of variable capacitors to assess what circuit would suit the present requirements. I ended up with Fig. 1.

This circuit must have appeared in just about every radio magazine since Marconi! So much for my original scientific experiments.

Okay, so evolution has narrowed the controls down to two. I found that with the capacitor set at one particular position, adjustment of the roller inductor alone could be made to resonate the circuit on 40m, 20m, 15m and 10m. So I lifted out the variable capacitor and measured it on my home-brew bridge. It turned out to be near enough to 100 pF. In went one fixed 100 pF, 1000V ceramic and the controls were down to one. Now to miniaturise the roller inductor and we might get something practical after all. A smaller tapped and switched coil was tried but without success. It became apparent that something infinitely variable was needed in the inductance department, but what?

While rummaging through assorted junk accumulated under the bench over the years, I came across a box containing some power rheostats of various size and resistance. Now these things I remembered show considerable inductance and 3 or 4 were tried in place of the roller inductor. I finally settled on one branded IRC wire-wound 25 watt, 50 ohms. There must be hundreds of these sitting around in junk boxes just waiting to be used in a project such as this. The wire-wound element is wound over a composition strip in a semi-circle inside the body of the rheostat, so if the one you come across has too high a resistance (too fine a wire) it should be a simple matter to replace the fine wire with something a bit thicker (and preferably of copper!—Tech. Ed.).

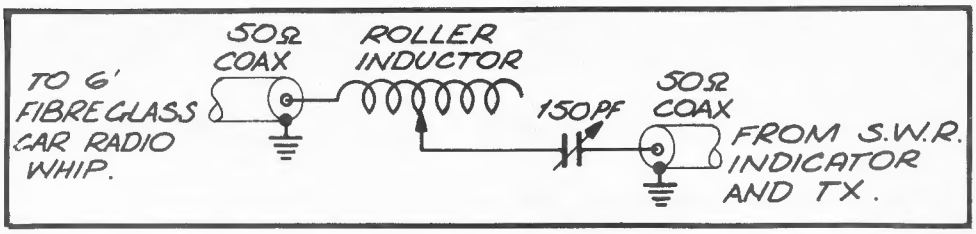


FIGURE 1:
Combining inductance and capacitance to enable matching of a short vertical radiator.

Well that turned out very nicely, now what to put in it? As usual, the junk box came to the rescue again, by way of one oil-filled capacitor of WW2 vintage, which when relieved of its innards left a metal box about 4 in. x 2 in. x 2 in.; just the thing to mount the components in. So there it is mounted under the dash of the Transit Van. Beside the FT-7, with just one adjustment knob out front to match the 6 ft. fibreglass whip to the FT-7 with minimum indicated SWR on 40m through 10m.

Now you next question naturally is "how does it go on 80m?", and my answer is "hopeless!". 6 ft. of whip appears to be physically too short to work efficiently on 80m; but don't worry, if you pull up in a caravan park or rest area, clip a length of wire (every amateur carries some on holiday) to the base of the antenna and run it out horizontal to the nearest tree branch, fence post or what have you, and tune it up with the little "VK2YO" under-dash tuner. I was surprised how well it worked at night, even with the FT-7 barefoot from such localities as Coonabarabran and Noosa Beach. If you can run out about 66 ft. (20m) in length (even if it is not in a straight line) that will work on 80m quite well.

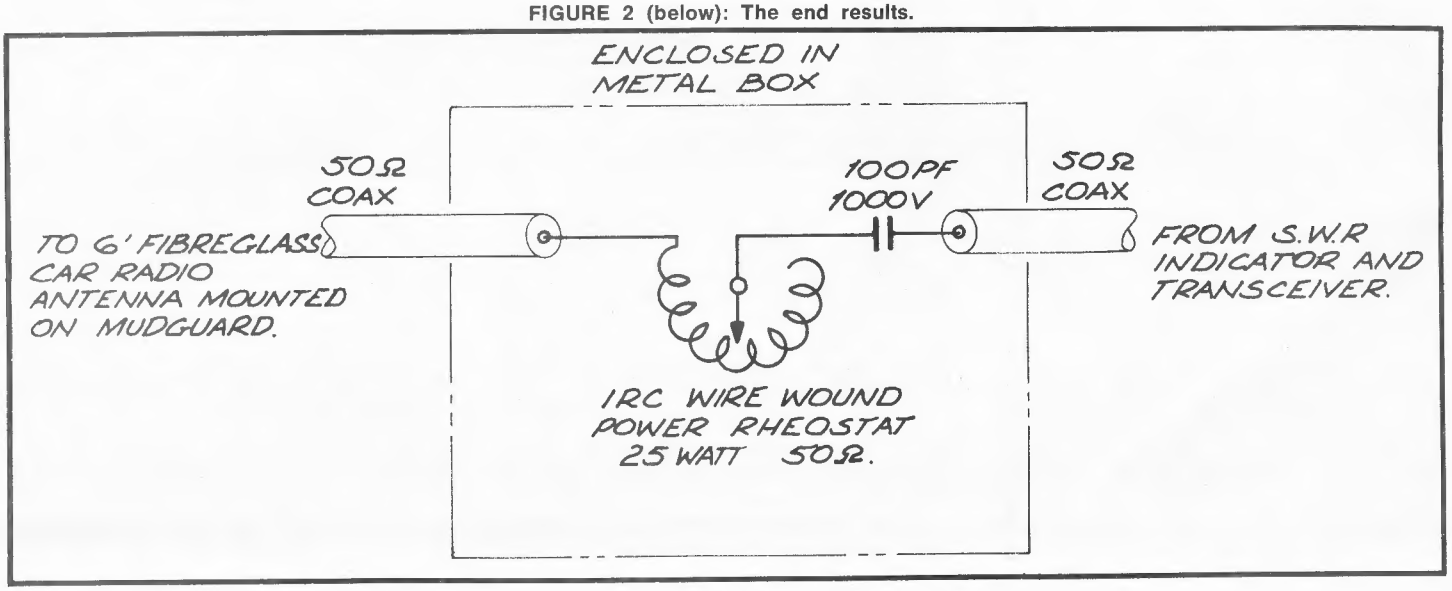
How does the 6 ft. fibreglass BC antenna and tuner compare with a helical, centre-loaded or base-resonated mobile whip? On a cost basis very well, as only one broadcast fibreglass whip is required for 4 band operation (the tuner cost nothing), and being a common sight on vehicles these days would not attract the attention of thieves. On an efficiency basis, I haven't got a clue, as I don't possess any other types of mobile or portable aerials to compare it with; and if I had I probably would not have gone to all this trouble in the first place! This project is a good example of the old axiom, necessity is the mother of invention; or if you keep something in that junk box long enough you will find a use for it!

And this is how it all ended up (Fig. 2).

I next plan to affix a wire to the perimeter of the pop-up fibreglass roof section of the Camper Van and tune that. If it goes okay can you imagine the cost saving in mobile whips that would represent? All anyone would have to do is buy a mobile antenna mount trade-named Kombi Campa or such like for X thousand dollars, and you would save at least $100 in mobile HF helicals. But don't go out and buy one of these Kombi mobile antenna mounts yet; wait and see if my idea works first.

(Note: Our first inclination was to publish this article in the April issue without comment, but the scheme does have some merit. The SWR would be low using an unmodified 50 ohm potentiometer, but so would the efficiency! With the potentiometer rewound with copper wire, and minimal coax length to the antenna, the system may well be usable.—Tech. Ed.) ■

FIGURE 2 (below): The end results.


ENCLOSED IN METAL BOX
50Ω COAX
100PF 1000V
50Ω COAX
TO 6' FIBREGLASS CAR RADIO ANTENNA MOUNTED ON MUDGUARD.
FROM S.W.R INDICATOR AND TRANSCEIVER.
IRC WIRE WOUND POWER RHEOSTAT 25 WATT 50Ω.

Modification of SSB 27 MHz PLL Tcvr for 10 m Operation

G. T. Ryan VK4AR

This article discusses the modification of the CYBERNET range of transceivers utilising the PLL02A phase-locked loop integrated circuit. Such sets include Super-Panther, Super Bengal, Appollo and Karinna.

The resulting changes allow operation with a 5 kHz channel spacing, almost to its limit frequency of 29515 kHz (see Tech. Ed. note). when using the existing channel selector and additional switches. While this may appear cumbersome, it does allow the modification to be simple and effected in a couple of hours.

In order to gain some knowledge from this modification additional information is included for your reference. The heart of the PLL circuit (PLL02A) is identical to a Motorola integrated circuit type MC145109. The pinout and internal block diagram is shown in Fig. 1.

PIN DESCRIPTION

Pin 15-7 P0-P8
Programmable divider inputs (Binary) which can set the division ratio (÷ N) between 2 and 511. This allows 510 channels with the highest frequency being 29.515 MHz (see Tech. Ed note). Internal pull-down resistors place logic zero on unused programme pins.

Pin 2 VCOin
Frequency input, to the programmable divider, which is derived from the VCO after being mixed with the heterodyne crystal.

Pin 3 REF-OSCin
Frequency input fed from the 10.240 MHz reference oscillator.

Pin 4 5 kHz/10 kHz
Placing an earth on pin 4 sets the reference divider to ÷ 2" and correspondingly divides the 10.24 MHz input to the required 5 kHz reference frequency.

Pin 5 DET OUT
This output voltage (DC) is for control of the external VCO frequency. Output voltage goes high when $\frac{F/vco}{N}$ is less than Fref.

The output goes low when $\frac{F/vco}{N}$ is greater than Fref which will be set to 5 kHz during the modification.

Pin 6 LOCK DET
This voltage goes low when PLL is in the unlocked state (e.g. during channel change) and mutes the transmitter to prevent radiation of an undesired frequency.

As seen in Fig. 2 the configuration is different from that found in the popular 2 metre synthesised rigs. In this instance the VCO frequency is mixed with twice the heterodyne crystal frequency and the sum is fed to the transmitter and receiver mixers, while the difference is the VCO derived frequency fed to the programmable divider input. This derived frequency is highest at the lowest frequency while decreasing to 10 kHz (5 kHz reference) at the highest operating frequency (29515 kHz — see Tech. Ed. note).

MODIFICATIONS
The modifications have been performed on a 23 channel Super-Bengal (Base Station), which vary from the mobile units in that a power supply is included and the channel selector is removed from the master circuit board and connected to it via a wiring form. When using either an 18, 23 or 40 channel switch certain frequencies will be missed because the switches were originally designed for the Citizen Band in which some frequencies are allocated for other services. Additional switches can be added to fill in the gaps left by the channel selector. Two stages of modification are described: (a) 10 kHz channelling, and (b) 5 kHz channelling.

Careful
The PLL02A is a CMOS device and may be destroyed due to carelessness. During modification ensure that the soldering iron is earthed and that the transceiver is not terminated to any power supply or other equipment.

Step 1
Pin 8 to be left open circuit by cutting the printed circuit tracks. The internal Pull-Down resistors place Pin 8 at earth potential.

Step 2
Pin 9 and 10 are to be connected to additional switches after cutting the printed circuit.

The NB lead is left open circuit to allow continuous NB operation which does not affect normal receiver performance. The PA/CB switch wiring is reconnected to allow CB operation only. The four combinations of these two switches and the channel selector in 4 x 320 kHz segments enables operation from approximately 28.245 MHz to 29.5 MHz (see Tech. Ed. note).

Step 3
Replace L2 (6.8 uH) with a 2.2k ¼W resistor if the VCO will not lock when frequencies above about 28.8 MHz are selected. Operation around 28.6 MHz will be normal without the above change (see Tech. Ed. note).

Step 4
After the above changes connect to a power source and place a high impedance DC voltmeter (20k ohm/volt or more) between TP1 and the negative supply terminal to measure the VCO control voltage. Careful adjustment of the VCO slug should alter the reading and it is suggested that at the lowest frequency setting the slug be adjusted for a reading of +4.8 volts. When the highest frequency is selected the control voltage should not fall

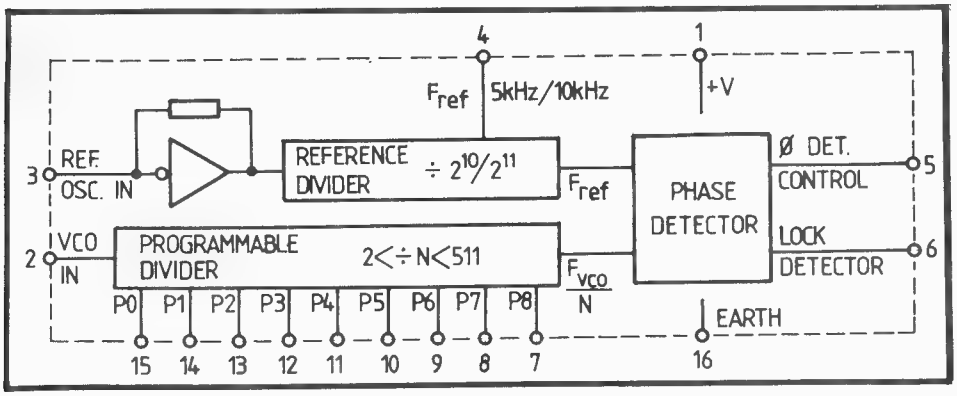


FIGURE 1: Phase locked loop MC145109 (PLL02A).

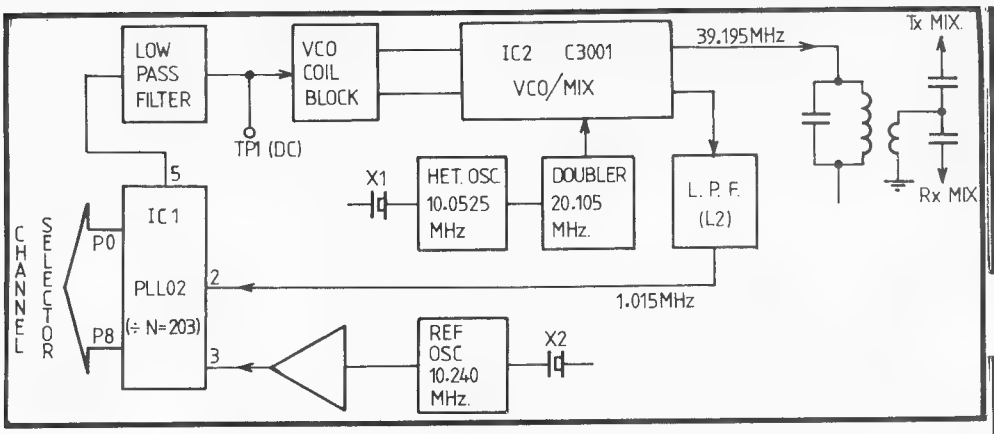


FIGURE 2: PLL block diagram — 28.5 MHz selected.

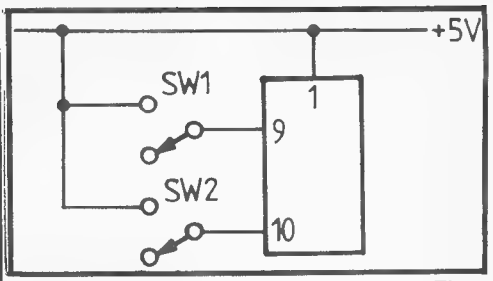


FIG. 3: Switches for extra channels. The NB and PA/CB switches were used for SW1 and SW2 respectively.

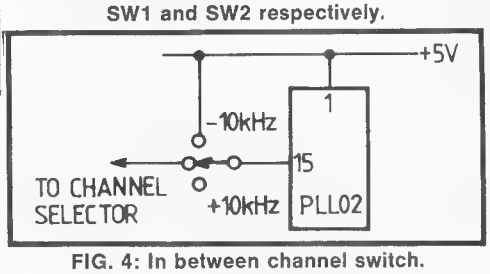


FIG. 4: In between channel switch.

to zero! In between frequencies will correspond to a control voltage between the above readings.

Step 5
Align the receiver and transmitter tuned circuits (see Fig. 6).

Step 6
Some in-between frequencies missed by the channel selector may be gained with the use of a three position switch connected between Pin 15 and the channel selector as shown in Fig. 4.

This switch can allow either an increase or a decrease in frequency by 10 kHz, depending on the channel selector position and its corresponding logic (Binary) code.

5 kHz CHANNELLING
This is a more complex operation, but the added advantage of a switch to select a frequency 5 kHz down from that on the channel selector will prove to be a great asset.

Step 1
Earth Pin 4.

Step 2
Cut the printed circuit going to Pin 9 and Pin 8 and take to the switches as in the 10 kHz version (Step 2).

Step 3
Now the complex and almost confusing part. The involved process is dependant on whether your set is a mobile or base station as the terminations of the channel selector pins have to be advanced up one position each on the programmable divider input connections, i.e. —

Switch	PLL02A
P0	P1 (Pin 14)
P1	P2 (Pin 13)
P2	P3 (Pin 12)
P3	P4 (Pin 11)
P4	P5 (Pin 10)

Pin 15 (PLL02) now becomes the 5 kHz Down select terminal and is taken to a switch mounted on the front panel.

With mobile units it will be necessary to cut the printed circuit connections between the switch and IC1.

Base station sets are easier as the wires on the switch need only be unsoldered and moved to the new termination points. *Beware* the pin out of the switch is not in Binary order and will need to be traced from the original pins of IC1 right through to the switch connections. A map may help your selection of the correct terminal (see Fig. 5).

Note the Brown wire is pulled out of the wiring form and taken to the 5 kHz Down switch mounted on the back of a replacement squelch pot. This conserved front panel space and drilling.

Step 4
In-between channels may be obtained by terminating Pin 14 (PLL02A) via the 3 position switch (as in Fig. 4) to the channel selector. This may be substituted in place of the dimmer or calibrate controls found on some sets.

Step 5
Replace L2 (6.8 uH) with 2.2k ohm resistor.

Step 6
Align the VCO and RX/TX tuned circuits (see Fig. 6).

ALTERNATIVES
Some may desire to modify their transceiver but consider the above method inadequate for their needs. Another approach is to disconnect the channel selector and use an external switch box incorporating the nine switches required. Both this method and the above work best if a frequency versus switch position chart is tabulated.

If the heterodyne crystal is changed, then the switch box concept would be more versatile as the switches can then be labelled according to frequency increase above the lowest or reference frequency which would probably be 28.000 MHz (as set by the crystal). E.g.:

SW1 = + 10 kHz	SW6 = +320 kHz
SW2 = + 20 kHz	SW7 = +640 kHz
SW3 = + 40 kHz	SW8 = +1.28 MHz
SW4 = + 80 kHz	SW9 = +2.55 MHz
SW5 = +160 kHz	

10 kHz Version.

An improvement on the above methods would be to build a scanner incorporating two 74C193 up/down counters and a programmable frequency counter. This however is more than just an afternoon's modification.

CIRCUIT
The modification could be carried out with only these instructions, but a schematic diagram would be a bonus to alleviate any uncertainties which may arise with the different models being marketed.

Once acquiring the circuit, it will be noticed that the VCO coil block is drawn as a block with no contents indicated. This resulted from the coil block being developed as a solder in component with all its individual parts encased in epoxy glue. The circuit is shown in Fig. 7.

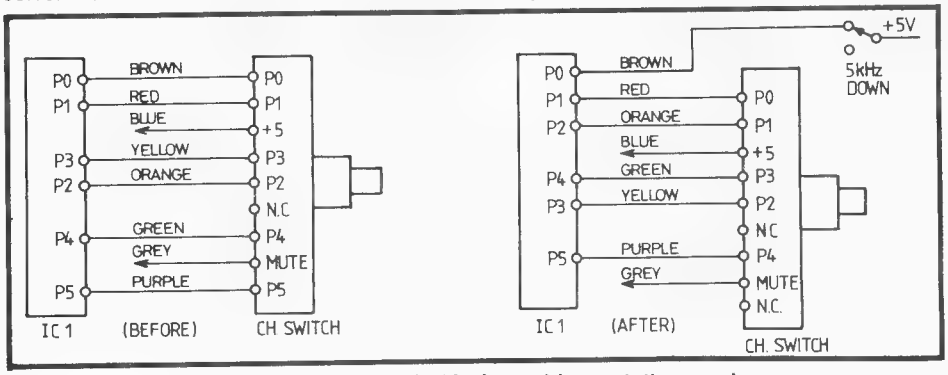


FIGURE 5: The author's 23 channel base station version.

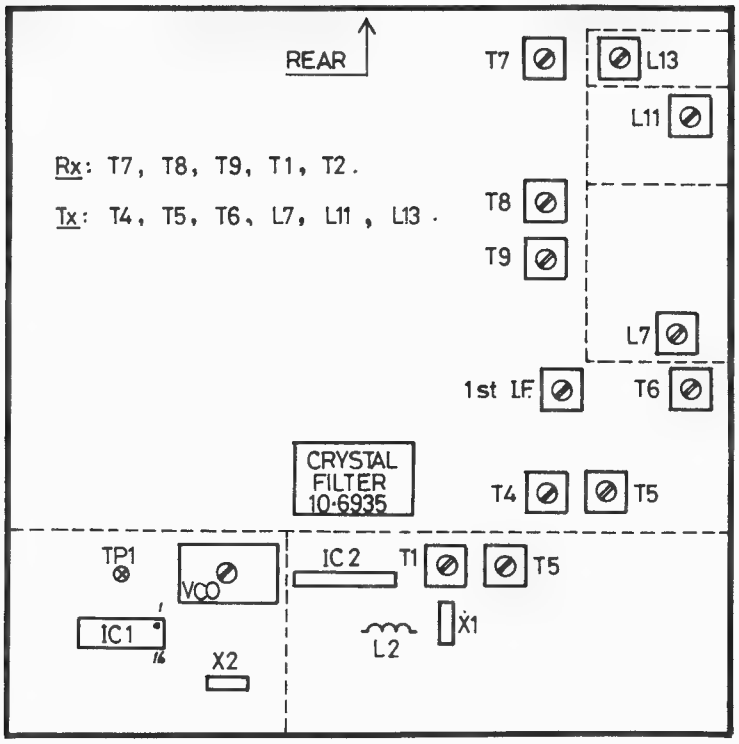


FIG. 6 (left): Layout of relevant components.

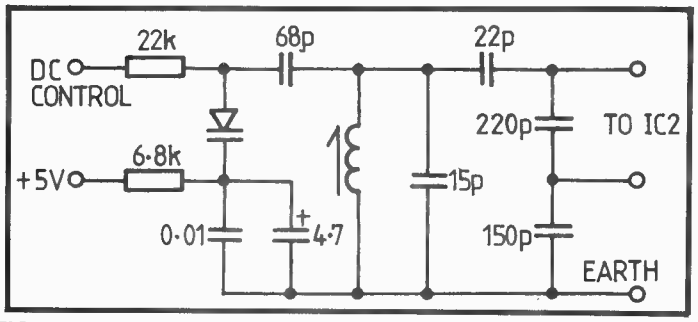


FIG. 7 (above) depicts the VCO block.

I hope this article will assist more amateurs to investigate PLL transceivers and enjoy the DX openings on 10 metres.

TECHNICAL EDITORS' NOTE

Whilst this modification has an apparent upper frequency limit of 29.515 MHz the possibility of spurious output is very great as this limit is approached.

As the upper frequency limit is approached the difference between the 20.105 MHz injection frequency and the VCO frequency become only a matter of a few kHz. As a result of this the injection frequency, which is the sum frequency, approaches the second harmonic of both the VCO frequency and the 20.105 MHz injection frequency.

For 29.500 MHz the input to the Phase Lock Loop programmable divider is 15 kHz and the injection frequency to the Transmit and Receive mixers is 40.195 MHz. However the second harmonic of the mixer injection is on 40.210 MHz and the second harmonic of the VCO is on 40.180 MHz.

Unfortunately a 40 MHz tuned circuit cannot be expected to reject signals only 15 kHz away and Spurious Response will result 15 kHz on either side of the signal.

Even a 1 MHz frequency difference as exists at around a 28.5 MHz output frequency will be approaching the limit of acceptable suppression of spurious responses.

As a result of the possible spurious responses this modification should NOT be used to produce output frequencies greater than 28.5 to 28.6 MHz. This should be regarded as the practical upper limit. ■

TRY THIS — WITH THE TECHNICAL EDITORS

ANTENNA CARRIAGE FOR FREE STANDING TOWERS

Listening around, I hear so many amateur operators who have handicaps of some kind and are unable to work on their beam antenna. Here is an idea for such people, and those of us who do not like climbing towers. The system is to have a track on which a carriage travels carrying rotator and antenna; this allows the antenna to be lowered down the side of the tower to which the track has been attached. The antenna shaft is set vertical and therefore at an angle to the side of the tower. As the beam is lowered it is moved to such a position that the elements clear the tower, and may be worked on at the 6 foot level rather than the 60 foot level.

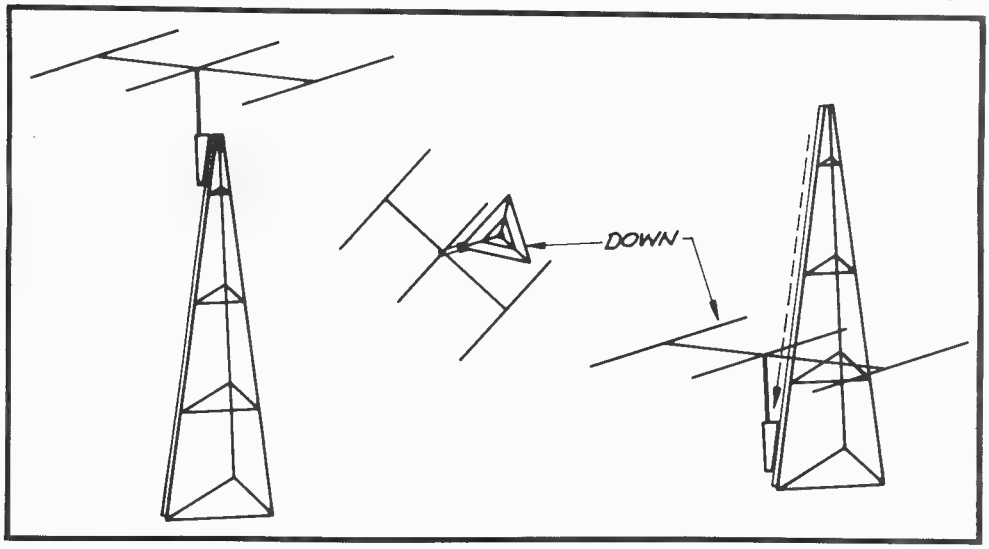


FIGURE 1.

John Tower VK6IM, 12 Ramsay Road Bunbury, WA. ■

MORSE EXAMS

Candidates for morse exams are specially reminded that the morse sending or receiving of letters is not adequate in itself. There is a space of 7 dots between words and this has to be observed so that whatever is sent or written down should be in understandable composition English. Thus, to omit a space between two words is one error. Many errors could be recorded against you if, for example, in receiving morse, you write down a string of letters not separated into discrete words. This reminder is given to dispel any rumours to the contrary and to alert candidates to the official requirements. ■

Satellite Solar Illumination

By Greg Roberts VS1BI
(Reprinted by courtesy of AMSAT-UK)

The computation of solar illumination conditions for artificial earth satellites has become of considerable interest to some amateurs in view of the behaviour of OSCAR 7 as outlined in OSCAR NEWS No. 26. Several articles have appeared in the amateur press on the subject, some of them good and some not so good, but perhaps I am biased because I think that the method I use is easier, whilst at the same time it is accurate, as shown by numerous optical observations of satellite shadow entry and exit predictions.

I must confess that the method was not developed by me, but is a bit cribbed here, there and everywhere, so there is no single source. Perhaps my approach was most strongly influenced by an article on "Solar Illumination" by G. E. Taylor that appeared in the "Artificial Earth Satellites" memoir of the BAA of August 1961. Another useful source was "Astronomical Papers Translated from the Russian", No. 12 of the Smithsonian Institute, May 1968.

The method to be outlined is incorporated in all my computer satellite tracking programmes and is employed as a small sub-routine and so far has proved entirely satisfactory.

APPROACH

1. Determine the declination (DEC) of the sun on the particular year day, D, required for. This can be obtained either from the current "Astronomical Ephemeris" (AE) or by calculation. Since most amateurs do not have access to the AE, the second alternative will be used. The expression is not 100 per cent accurate but is more than good enough for our purpose.

   DEC = 23.4417 sin [(D — 82.3) 0.98562] . (1)

   example:
   For Jan. 31, D = 31 and
   DEC = —18.10°
   For May 26, D = 147 and
   DEC = +21.03°

2. Determine the value of T where T = 12 hours plus the equation of time. This item is also given in the AE but it can be calculated as follows:

   N1 = 8 sin [D — 1.2) 0.98563]
   N2 = 10 sin[(2D + 17.) 0.98563]
   hence
   A = N1 N2 and T = 12 hrs + A
   .... (2)

   example:
   For Jan. 31, D= 31, A = 13.7,
   T = 12 hr 13.7 min
   For May 26, D = 147, A = —3.38,
   T = 11 hr 56.7 min

   N.B.: Throughout all these calculations Greenwich Mean Time will be used.

3. Evaluate the quantity
   B = (time required for — T) ..... (3)
   and convert to degrees, recalling that four minutes of time is equal to one degree of arc.

4. Determine the quantity of DY where
   DY = SATLONG — B .. .. (4)
   where SATLONG is the sub-satellite longitude at the time required for and DY is the difference in longitude between the sub-satellite position and the sub-solar point B. If DY is GREATER than 180°, subtract it from 360°. Ignore the sign of DY.

5. Compute the angular distance between the sun and the satellite:
   cos X = sin (DEC)s in (SATLAT + cos (SATLAT) cos (DY) .... (5)
   where DEC is from equation 1, SATLAT is the sub-satellite latitude and DY is from equation 4.

6. Evaluate:

$$S = \arccos\left(\frac{6370}{6370 + H}\right) \quad \ldots\ldots\ldots \quad (6)$$

   where H is the height of the satellite, in kilometres, above the earth's surface. For OSCAR 7 S = 35.5°.

7. Determine:
   EP = 90.7 + S . . (7)
   where EP is the point by which time the satellite has faded several magnitudes in brightness and is in effect completely in shadow. Observation has shown that the value of 90.7° is more close to the true situation than 90°.

8. Compare EP and X.
   If X is GREATER than EP, satellite is in SHADOW.
   If X is LESS than EP, the satellite is in SUNLIGHT.

That concludes the method and I do not think the maths will scare anyone, but to try and make it clearer, let us do an example:

PROBLEM

In mid-February 1980 it was reported that OSCAR 7 was experiencing mode slipping near the southernmost portion of its orbit in the vicinity of South America as a result of poor solar illumination. Is this correct?

SOLUTION

From a ground track computation the following is obtained:

DATE: 15 February 1980. TIME: 21 h. 13 m. 00 sec. Z. LONG.: 345.25°W. LAT.: —72.96°. HEIGHT: 1461 kilometres.

We now obtain D = 46 days.

DEC = 23.4417 sin [(46 — 82.3) 0.98563] = —13.705°.

N1 = 8 sin [(46 — 1.2) 0.98563].

N2 = 10 sin [(92 + 17.2) 0.98563].

A = B1 + N2 = 15.10 minutes.

T = 720 minutes + 15.10 = 735.10 minutes.

B = (21 hr. 13.0 m. — 735.10) = 537.90 minutes = 134.475°.

DY = 345.25 — 134.475 = 210.775° = 149.225°.

Cos X = (sin —13.705 sin —72.96) + (cos —13.705 cos —72.96 cos 149.225)
X = 91.036°.

S = arc cos [6370$(6370 + 1461) = 35.567°.

EP = 90.7 + 35.567 = 126.267°.

Since X is 91.036° the satellite is out of shadow by 126.267 —91.036 = 35.2°, so it CANNOT possibly be experiencing mode slips DUE to poor illumination, as in fact it is very far from the earth's shadow. Additional checks for all southern latitudes on this date will reveal that there is no illumination problem, so any mode slipping must result from some other cause.

As a matter of interest, the entire orbit of OSCAR 7 was examined at one minute intervals (by computer) for every 15th day of the month for solar illumination and is summarized in the table below:

Date	Max.	Lat.	Min.	Lat.
15 Jan.	57.5	—30	14.9	+31
15 Feb.	53.5	— 6	18.9	+ 7
15 Mar.	56.3	+24	16.0	—25
15 Apr.	65.2	+44	7.1	—46
15 May	72.6	+58	—0.4	—57
15 June	75.6	+60	—3.3	—62
15 July	73.1	+60	—0.7	—60
15 Aug.	66.3	+55	6.1	—56
15 Sept.	59.3	+33	13.0	—34
15 Oct.	56.6	+ 2	15.8	+ 2
15 Nov.	56.8	—24	15.6	+25
15 Dec.	55.6	—37	16.8	+37

where Lat. is latitude in degrees; south is —, north is + and Max. and Min. are the maximum and minimum distances the satellite is clear of the earth's shadow.

From this some interesting information can be obtained:

(1) The satellite will experience maximum solar illumination in mid-June over 60° north latitude during the northern hemisphere summer.

(2) The only time the satellite will be in eclipse is from about mid-May to the end of July and occurs with the satellite in the southern hemisphere — local winter — with the satellite being deepest in shadow about 60° south.

(3) As would be expected, the maximum illumination for any particular month is 180° away from the position of minimum illumination.

(4) It will be noticed that the sum of Max. + Min. is always about 72.4°. The significance of this escapes me at the moment!

It should be pointed out that the illumination conditions for a sun-synchronous satellite depend primarily on the satellite latitude. If the satellite is in shadow over South Africa on say 30° latitude, then the satellite will be in shadow every time it crosses 30° south latitude on that particular date. (There will be a slight drift of the satellite either deeper or shallower into eclipse, but this can be ignored, except in cases where precise values are necessary.) Solar illumination is not a longitude dependent function for satellites such as OSCAR 7 and OSCAR 8 as the orbital plane always passes over a particular location at the same local time each day — note that orbital PLANE is specified and the satellite could be anywhere around its orbit.

I hope this simple explanation of solar illumination will shed some light on the subject for those who are in darkness — puns intended! ■

Audio Activated Saturating Switch

Ralph Holland VK2ZZB
388 Rouse Street, Tenterfield, NSW 2372.

I lived in a country area at the time and we had a pirate frequenting the 2 metre band. As in most country areas the normal ham activity was sparse, particularly on the 2 metre band. Thus the AASS was designed to interface with the audio output of my rig and the remote/auxiliary sockets of my cassette tape recorder for unattended recording.

The following points were kept in mind:

1. The amplification must be such that audio turns on the switch but noise does not operate it.
2. There must be provision to adjust the level of audio to the auxiliary (or perhaps the microphone) socket, in case the tape recorder does not have automatic level control or becomes overloaded.
3. The unit should not draw too much power and if possible be portable. (A saturating transistor switch was employed to that effect.)
4. There must be a hold facility so that the switch remains saturated long enough for the recorder not to break during short intervals or even between words.
5. The switch must work as quickly as possible.

These requirements have been fulfilled with the simple circuit that follows. The fifth requirement, as expected, could be improved upon. The best way would be to supply audio via a delay to the tape recorder so that the motor has sufficient time to start — but this complicates an otherwise simple design.

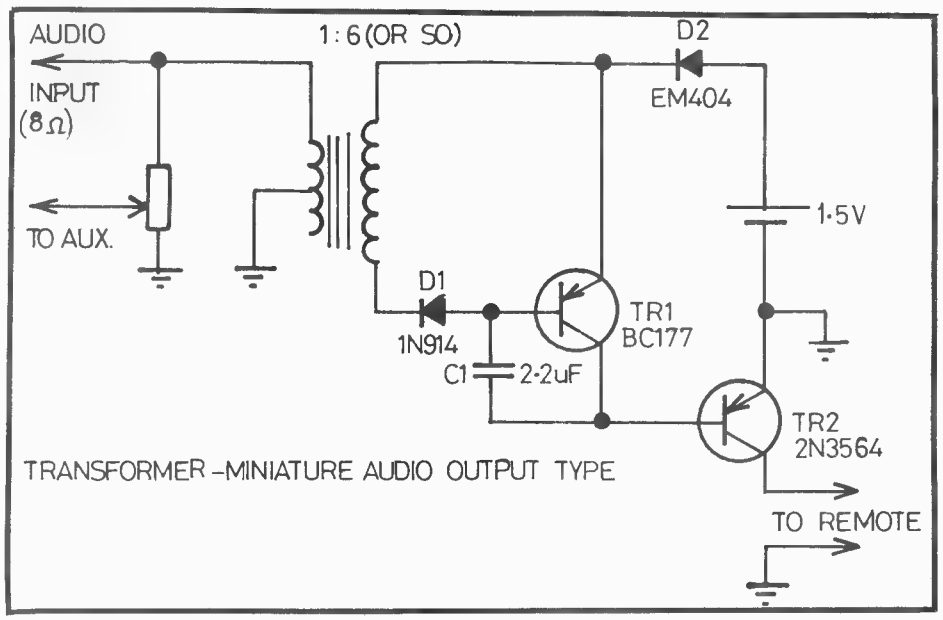


FIG. 1: Audio Active Saturating Switch.

DESIGN AND OPERATION

The audio transformer, as well as supplying audio of sufficient level to be rectified, provides good isolation between the audio lines and the remote switching lines. It allows the possibility of using either positive or negative earth supplies. (The remote lead polarity need only be changed at the saturating switch.)

To ensure saturation of the transistor, sufficient current must be applied through the base — emitter junction.

To obtain a "hold", but not a delay, a 2.2 uF tag tantalum capacitor is connected from the base to the collector of TR1.

Low level audio is applied to the input lead and is returned to the tape recorder via the level control; the remaining audio path is via the input transformer. The transformer transforms the low level voltage in the primary to a high enough level in the secondary to overcome the junction potential of diode D1. The diode rectifier provides sufficient current to turn on TR1, and C1 supplies the holding current so that TR1 always remains on for at least some predetermined interval. The current flowing through TR1, provided by the 1.5 volt battery, causes TR2 to saturate. The collector-emitter voltage drop approaches 0.1 volts or so. D2 provides a forward biased voltage drop sufficient to limit the current from the dry cell. Note the two different earth returns. ■

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Two Metre Linear Amplifier with a difference — using a QQE 03/20

Gordon Loveday VK4ZBI/NMJ
"Aviemore", Rubyvale 4702

Many circuits have been through the pages of AR over the years, most using transistors. However, the writer was brought up with valves and gets most satisfaction working with these "outdated" marvels.

Most valves are much easier on the pocket and can survive a mistake of the builder. Having tried quite a few circuits, with varying degrees of success, I tried to put some ideas of my own to work. I might mention that I don't expect everyone will get the same results as I have. Firstly, my HT is 330V under load, from a DC/DC power supply, with 12V DC input. I use battery bias on the final. The idling anode current is 2.5 mA peaking to 100 mA on carrier, with an average of around 75 mA on voice peaks. The power supply is capable of about 250 mA. Relays are operated either by COR circuitry or PTT, whichever suits the builder. The screens are opened on receive position. It appears that there are quite a few types of the popular QQE03/20 to be had; some are more suitable on 2m than others. Mine are Philips (with gold-plated pins). Other brands, i.e. Brimar, Marconi, Mullard, may show signs of not wanting to co-operate, in being difficult to tame. No neutralising was needed in my unit, however I did take the precaution of lining up the chassis level with the circular shield within the tube. I do not provide coil data as this never seems right in any other layout! However, most VHF addicts will find this no problem. I found a shield helped in my layout around the base end of the final. The input from the IC202 was much easier to feed in directly than with the usual inductor coupling, but please yourself here. All the parts came from my "junk box". The unit lifts my signals 2 S points from my QTH to Rockhampton (380 km). Let's hear some more 2m activity from all you barefooted IC202 owners! ■

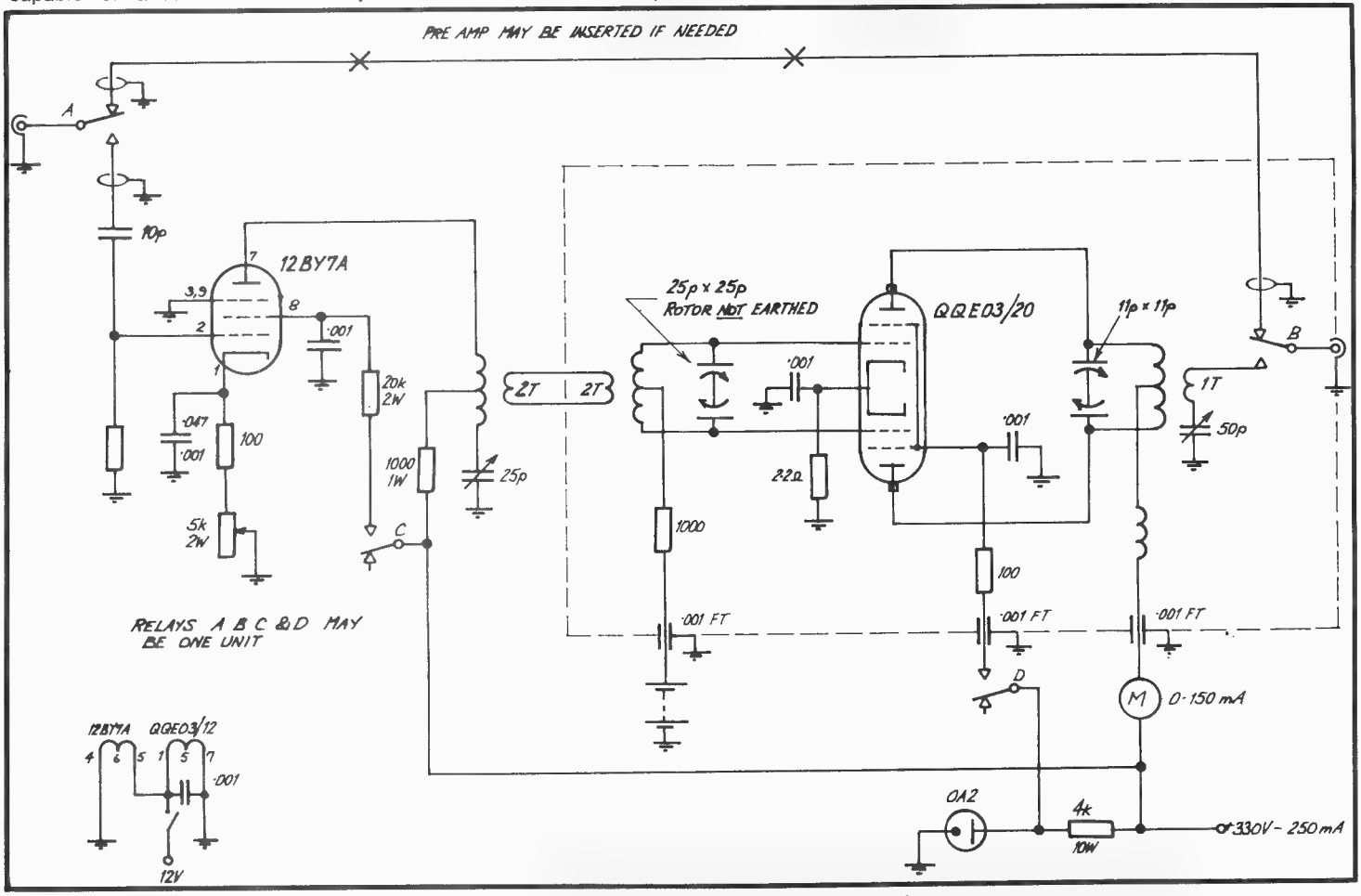
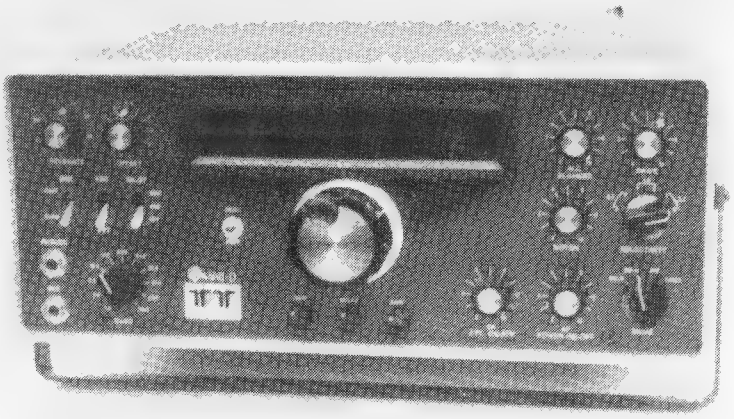


FIGURE 1: Circuit for the 2m linear using QQE03/20.

Equipment Review

The Ten-Tec Omni-D Series B Transceiver

Review Article and Photos by
Ron Fisher VK3OM
3 Fairview Avenue, Glen Waverley, Vic. 3150



The American TEN-TEC Company has for some years produced an interesting range of amateur gear with an emphasis until recently on simple low power CW and SSB transmitters, receivers and transceivers. While, in this country at least, they are best known for their little low power Argonaut transceiver, their full feature 100 watt output transceivers have had a small but enthusiastic following for the last two or three years. Our review is of the latest of these transceivers.

TEN-TEC are represented in Australia by Graham Stallard of Lockleys, South Australia.

As we have stated in equipment reviews before, it seems that most of the real advances in amateur design come initially from the United States. Perhaps in view of this, it is a strange thing that we seem to buy Japanese equipment in large quantities, but only relatively small quantities of American gear. Let us take a good look at the TEN-TEC OMNI and see what it has to offer. There is no doubt it has a lot to offer and in fact has possibly more operating aids than any other transceiver on the market.

But first let us get an overall picture of the OMNI. It has full amateur band coverage from 160 to 10 metres, with 10 MHz coverage for reception of WWV and future modification for transmission on our new band in this region. There is also an auxiliary band switch position for another of our future new bands. The OMNI is fully solid state and in common with most other transceivers of this type, does not require any transmitter output tuning. Power supply requirements are 13.8 volts which makes the OMNI ideal for mobile or portable use, for home station use a power supply delivering a peak output of 18.5 amps is required.

First encounter with the OMNI produced a slight surprise. It was larger than I had imagined. It is in fact 360 mm wide, 355 mm deep and 140 mm high. This makes it of similar size to the larger Japanese transceivers with valve finals and in-built power supplies. I would make this point a very definite plus. When the cabinet is opened up, all of the 23 circuit boards are instantly accessible. Trouble shooting or adjustment would be easier with the OMNI than on any other rig I can call to mind.

The cabinet is in two pieces, making accessibility very easy. The material used is vinyl covered aluminium, and it is perhaps here that the OMNI loses points. It is definitely a plain Jane. While the overall appearance is attractive and certainly functional, it in no way compares with the equipment styling that we are used to in Japanese gear. And therein lies the possible reason that we favour Japanese amateur products. What do you think? Does styling sway your thinking? If so, then read on and we might change your ideas.

We started off by saying that the OMNI offered more in operating aids than any other transceiver on the market. Let us look at them.

First off, most current transceivers do not provide CW operators with anything approaching state-of-the-art facilities. The OMNI provides full break in CW up to about 50 words a minute. Add to this three active CW audio filters with bandwidths of 150, 300 and 450 Hz, plus the optional 500 Hz crystal filter and a most effective notch filter, you might start to get the picture. For further comments on the OMNI CW performance, I suggest readers refer to Geoff Thompson's article "New Developments for the Morse Enthusiast" in January 1980 Amateur Radio.

It should be noted that the new series B we are reviewing has some additional features over the earlier OMNI which Geoff refers to in his article, namely the notch filter plus greater flexibility with the filter switching.

Receiver offset tuning is switched to allow for two degrees of bandspread, ± .5 kHz or ± 5 kHz. In use I found the .5 kHz offset to be the most useful, and I have felt for a long time that most transceiver RITs go too far. With this system you can have it any way you like.

The digital readout has a novel feature. The six LEDs are each about 1.2 cm high with the last or 100 Hz indicator in green instead of red for all the others.

THE OMNI CIRCUIT DETAILS

The OMNI is based on a single conversion 9 MHz system. The standard filter supplied is a 2.4 kHz 8 pole device with a shape factor of 1.7 at 60 dB down. Available as optional extras are a 1.8 kHz 8 pole filter and a 500 Hz CW filter. Front panel switching is arranged to allow the 2.4 and 1.8 kHz filters to be in series for exceptional SSB selectivity. The MOSFET RF stage for the receiver operates without AGC and the RF gain operates on the IF stages only. This, along with the double balanced diode first mixer, provides a high degree of front end performance. Cross modulation and strong signal handling are excellent. The receiver has a Resonate control to tune the preselector for peak performance. This control operates on receive only. Receiver sensitivity is automatically set to provide a 10 dB S = N/N on input signals of 2 uV on 160 metres through to .3 uV on ten metres. In addition to all of this an 18 dB attenuator using PIN diodes can be selected with a pull-on switch on the RF gain control. No calibrator is provided with the digital readout, but the OMNI can be obtained with a normal analog dial and a calibrator with push button On and an adjustable time off of five to ten seconds. The digital readout is set up to give an accurate reading while in the normal sideband position. When switched to reverse sideband or CW the readout will be in error by up to 2.5 kHz. The transmitter output stage is rated at 100 per cent duty cycle, an important consideration for RTTY and slow scan operators.

Power output on both CW and SSB can be varied from full output down to a few watts for QRP operation by means of the drive control. Metering is a little on the bare side for a transceiver of this class.

Apart from the S meter only an SWR reading is provided in the transmit mode. A red LED just below the S meter shows when the transmitter ALC is in operation.

THE OMNI ON AIR

Our review model was supplied with the matching TEN-TEC power supply which has a built-in ammeter. Power output was checked by feeding a Heath Cantenna via a Drake W-4 ammeter. We obtained the following figures on steady CW carrier; 160, 80, 40, 20, 15 and 10 metres gave the following power — 110, 105, 100, 90, 80 and 80 watts. PEP output on SSB was slightly higher as indicated on the Heath SB610 monitorscope. Transmit waveform was excellent and speech quality was clean with the quality dependent on the microphone used.

VFO stability was adequate with just on 500 Hz drift measured over a one hour period. After the first hour the drift rate slowed down to a marked extent. This amount of drift is adequate, but not exceptionally good compared with many current transceivers.

The tuning was exceptionally smooth and covered the band at 18 kHz per turn of the knob. All wanted controls are on the front panel including VOX gain, delay and anti-trip. One interesting function brought out to the rear panel is a spare set of band switch contacts to operate an external antenna switching relay or other device requiring selective band switching.

In all the OMNI proved a delight to use and the superb selectivity with the notch filter pulled many signals through that were not copiable on other transceivers set up for comparison.

One feature not appreciated was the carry handle come tilt device. It did its job in lifting the front panel to a convenient height but was rather hard on the polished surface of my desk.

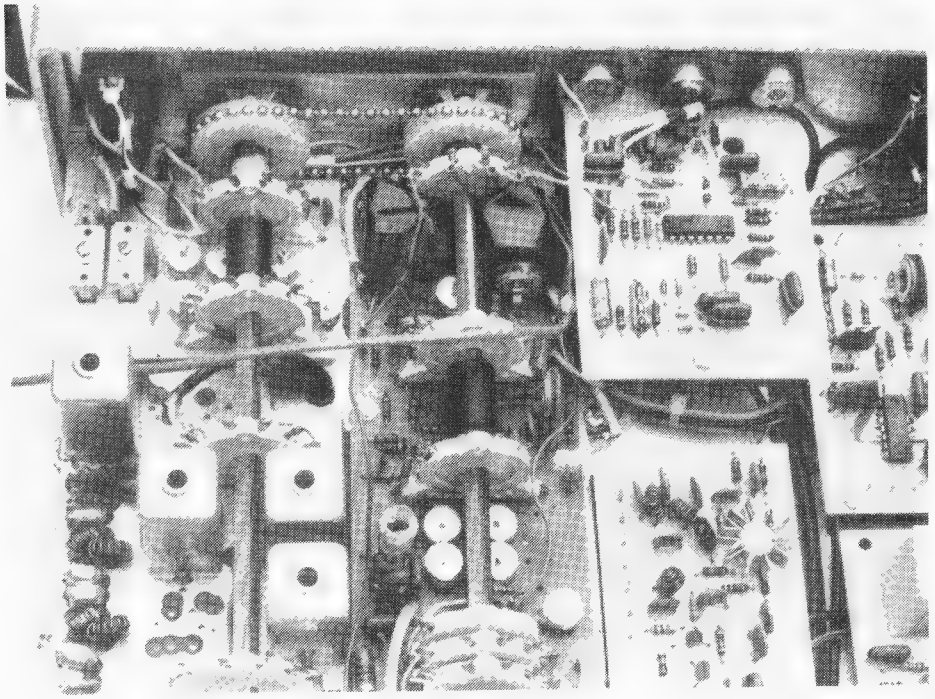


PHOTO 2: Close up of the inside layout of the Ten-Tec Omni-D Series B Transceiver.

Two speakers are built into the bottom rear of the OMNI cabinet and are described in the TEN-TEC literature as Dual Compression-loaded speakers. They are claimed to eliminate the need for an external speaker. I must say that I did not like the quality from them. I am one of the old school who prefers a large external speaker which I consider gives a better transient response. However, in fairness, some other operators who heard the OMNI rated the quality as good. There is no rear panel connection for an external speaker, but one can be fed from the front panel headphone jack. The microphone is connected by a standard tip ring and sleeve plug and a high impedance unit is required. No speech processing is included in the OMNI but with the 100 per cent duty cycle there would be no problems in using one.

A few internal receive spurious signals were noted when tuning around. Most are well down and would not be heard during normal operation, however one on 28.980 was over S9 on the meter.

INSTRUCTION BOOK

The instruction book would have to be the one by which all others should be judged. I had previously seen the instruction manual of the TEN-TEC Argonaut and was most impressed with it. They are keeping up the standard. Each circuit board is described in some detail with a large photo showing the location of components. An individual circuit of the board is published along with the above details.

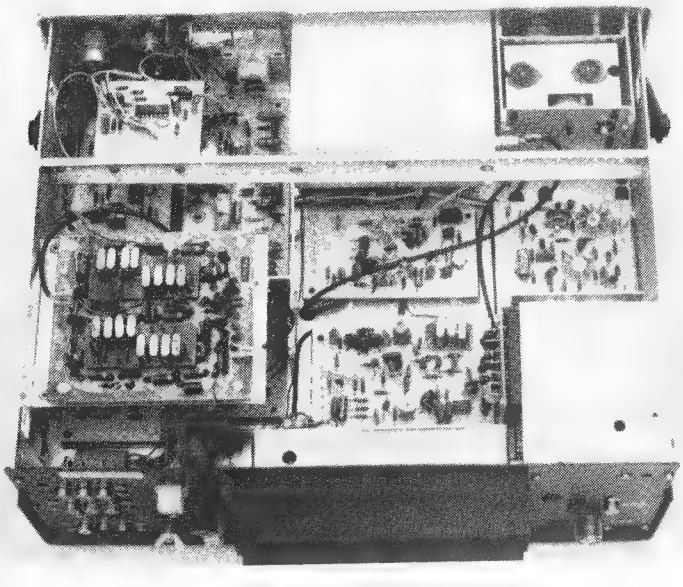
CONCLUSIONS

As stated at the beginning of the review, the OMNI offers many features just not obtainable on other equipment. It is however a relatively expensive transceiver by present standards (current price should be checked with the agents), but if you are looking for a transceiver that will perform where others will give up or if you are a really keen CW man, the OMNI may be just what you are looking for.

Before writing this review I contacted a few TEN-TEC owners (all Argonauts) to check on Graham Stallard's service. Take a bow, Graham, they were all unanimous that your attention was the best they had ever had.

For details of price and delivery of the TEN-TEC OMNI contact Graham Stallard, 27 White Avenue, Lockleys, SA 5032. ■

PHOTO 3: Top view Omni-D.



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Amateur Radio for the Cruising Yachtsman

PART TWO

Last month we featured Part 1 of this article which told us how amateur radio communications enabled yachtsmen to maintain reliable radio contact with land-based stations, etc.

Here now are the author's views on how we may integrate amateur radio with the yachting community, and perhaps improve our public image with great benefits to ourselves and yachtsmen in general —

Feedback from readers is most important to enable the Wireless Institute of Australia to formulate a policy in this area.

Amateur radio is the fastest growing communication media for the foreign going yacht, and the Wireless Institute of Australia is missing out on an excellent chance to gain new members, but more importantly, gain the support of an influential section of the community by outwardly promoting amateur radio to racing and cruising yachtsmen in Australia. The marine frequencies are of very limited use and Australian made type approved marine SSB is very expensive. Except for racing yachts, who have to fit it in order to be allowed to race, many people are looking for another media of communication.

As is often the case, poor old Aussie lags behind the times and is very reluctant to change. The P. and T. Radio Branch is pushing for marine VHF and rightly so, but it is not taking one as it has in Europe and the USA. The reasons are threefold:—

1. Australian made type approved sets are up to twice the price of US made counterparts.
2. Australian technical specifications prevent admission of foreign made gear on to this market, not to mention high import duties — with the exception of some high priced European sets.
3. OTC is very very slow to install VHF repeaters for international marine VHF channels, consequently operations are restricted to near principal ports and cities. It is therefore not possible to make a coastal cruise and be always in VHF radio contact as it is with amateur 2m equipment.

Getting back to marine HF SSB. Cruising yachtsmen in USA, Canada and lately UK, hardly even consider fitting it any more. Prior to 1976 before the "Sorcery" capsize incident was publicised in "Sail" magazine, American yachts heading into the Pacific often had marine SSB. So many found it so useless once away from USA that they tried to sell it during their cruise, usually to uninformed Australians and New Zealanders. However, in the last two or three years the situation has changed. The Americans and Canadians don't even have marine SSB aboard. Those who intend foreign cruising into the Pacific and Atlantic get their amateur licence and fit HF SSB amateur transceivers. There are hundreds such yachts every year leaving North America and very few of them are "pirates". The ARRL and FCC have seen to that of late. In any case most former pirate calls got themselves qualified during their cruising when they had the time to study.

The choice is obvious. Fit a marine SSB 100 watt set with 12 or so crystal locked channels costing around $1,600-$2,000 and be able to communicate on a very limited basis, or fit the same power amateur transceiver at half the price and have world-wide communication capability no matter where you sail. In this sense the amateur licence is worth $1,000 to the holder, and dozens of lives have been saved at sea by amateur radio when all else failed.

Recently the English have got the message and amateurs keen on sailing have set up a UK maritime mobile net for boats heading across the Atlantic and down to the Mediterranean. They did more than that. They set up an amateur station aboard a yacht at the "In the water boat show at Southampton". It aroused tremendous interest.

Of course any US yachtie will tell you that it was Atlas Radio that deliberately promoted "Ham Radio Afloat" in the USA, but all Herb Johnson was really doing was telling people in sailing of what was already known to be an excellent idea by a handful of hams on yachts in the Pacific as early as the late 1960s and early 1970s.

In Australia the only group that can effectively promote ham radio for yachtsmen is the WIA. Myself and many other yachtsmen who are amateurs and are experienced foreign cruising folk or land based amateurs involved in maritime mobile nets consider that the WIA should do exactly that.

The reason are:—

1. More people in amateur radio means a stronger and larger pressure group to prevent loss of amateurs' share of the frequency spectrum.
2. Amateur radio has proven itself to be the most effective SOLAS communication media for the small craft. There are countless examples all documented in USCG logs, Australian Coastal Surveillance logs, logs of maritime mobile net control stations and maritime mobile stations.
3. As previously stated, the WIA would gain support of organisations involved in sailing, particularly yacht clubs, who organise long races such as Sydney-Suva Race and Parmelia Race. The Cruising Yacht Club of Australia recently showed great interest in amateur radio. But it is the rapidly increasing numbers of cruising yachtsmen who are now just beginning to realise the advantages of amateur radio and therefore represent a new group in the community from whose support the WIA could benefit and to whom the WIA can offer guidance.
4. Learning by overseas experience the increase in amateur radio afloat will go ahead in this country with or without the support of the WIA. It is only proper that the WIA should be involved in any extension of amateur radio in this country and in the interests of good public relations is well advised to show positive interest in what is a new area of amateur radio, at least to the majority of the yachting community.

It has become obvious to me that the ARRL is well known to American and Canadian yachtsmen, but most Australian yachtsmen have never heard of the WIA. In the same vein why is it that 99 per cent of Australians don't know that for the first 48 hours of Cyclone Tracy all communications with Darwin were through radio amateurs?

Like so many friends, I worked to get my amateur licence and it's more than a little disconcerting to hear that the grapevine around Melbourne yacht clubs simply assumed that the amateur station aboard "Assegaai" was illegal. The average yachtie thinks that an amateur radio aboard a yacht is some special kind of CB.

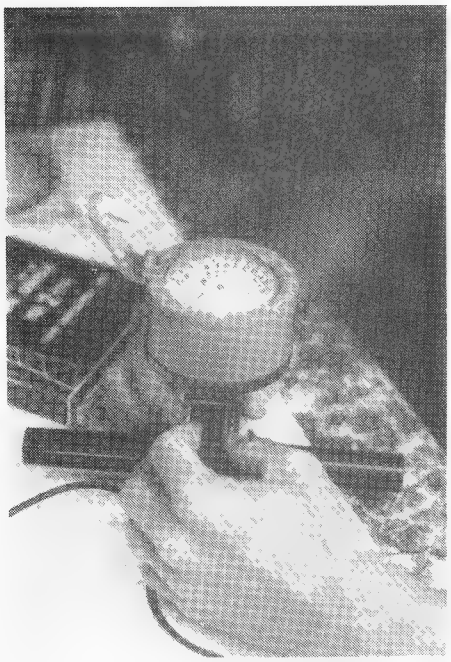

PHOTO 3: Using the Brookes and Gatehouse RDF hand held antenna to find the bearing of radio-navigational beacons. The operator uses headphones and rotates the antenna until a null is found.

How then can the WIA promote amateur radio to the yachting community should it see fit to do so? Atlas Radio Inc. always has a stand at the Los Angeles Boat Show in the interest of advertising. UK amateurs recently set up a demonstration station on a boat in the "Southampton in the water show". The response was dramatic.

WIA affiliated clubs run amateur stations and Scout jamborees. Why not set up an amateur station on a cruising yacht at the annual in the water yacht/boat show in Sydney? A small WIA stand at the Melbourne, Sydney and Brisbane boat shows would do marvels for PR, and some of the amateur radio dealers would only be too happy to subsidise such a stand as long as their equipment was on display. Every second cruising yacht in the Pacific has an Atlas or Yaesu and quite a few other brands enjoy sales in that area.

No doubt the secrecy provisions of the Australian regulations are helping prevent the amateur radio fraternity from gaining the respect it deserves from the community at large.

I have been personally involved in rescue operations in which amateur radio was the only communications media even before we had amateur gear aboard "Assegaai". There are several details of emergencies at sea down in "Assegaai's" radio log which would make excellent news type articles for the yachting magazines and do wonders for improving public respect for amateur radio. However the secrecy provisions prevent me from giving them to editors who have shown great interest in getting them into print. It's ironical that half the Pacific know of many such incidents whilst the Australians are kept ignorant

"Solo's" trip to Antarctica clearly demonstrated the advantage of amateur radio and was well covered in AR from the communications angle (see AR August 1978). It was also well publicised in Modern Boating/Seacroft Magazine in an interesting colourful article. However the absence of any mention of the second-hand Atlas 210X transceiver aboard was significant, especially when one considers that as cruising yachtsmen David Lewis and his crew found the amateur gear so useful, as do many of their counterparts all over the world. The net effect, however, is that once again the Australian yachting community, unlike its overseas counterparts, remains in the dark.

Lastly, the WIA could promote greater awareness of maritime mobile amateur radio among its own members by running an MM news column in AR. This would work well as long as amateurs involved made the effort to provide the written information. Perhaps my article will spark off some interest with AR readers. It certainly will in the yachting community. ■

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HOW TO ORDER

Send your request with blank ¾" Umatic cassette(s) and sufficient stamps to cover postage from Adelaide to your town to:

JOHN INGHAM
Federal Videotape Co-Ordinator
37 Second Avenue,
Sefton Park, S.A. 5083

The Emergency Net

Ken Ayers VK4KD

Here on Queensland's sunny Gold Coast we are prepared for just about any contingency, whether it be a lost bush-walker in the hinterland or a full force cyclone.

About two years ago the writer realised that the local amateurs could play an important part in assisting the authorities with back-up communications in various situations and, after studying reports about Darwin, Brisbane floods and overseas disasters, prepared the basis of what is now called the GOLD COAST AMATEUR RADIO EMERGENCY NETWORK.

It was decided that every amateur living between Kingscliffe, in the Northern Rivers area of NSW, and Beenleigh to our north, a coastal strip of some 50 miles, would be able to participate in an emergency.

The hard core of the network, some 15 amateurs, who were dedicated enough to give priority to other people's needs, were approached and "detailed" for specific important jobs should the occasion arise. (We used to call this "volunteering" in the RAF.)

After much sweat, blood and tears, the original plan was evolved and monthly exercises commenced. We soon found that there was more than the one plan needed, in fact separate situations could arise needing a different plan fo reach.

We now have three plans — A, B and C — as follows:

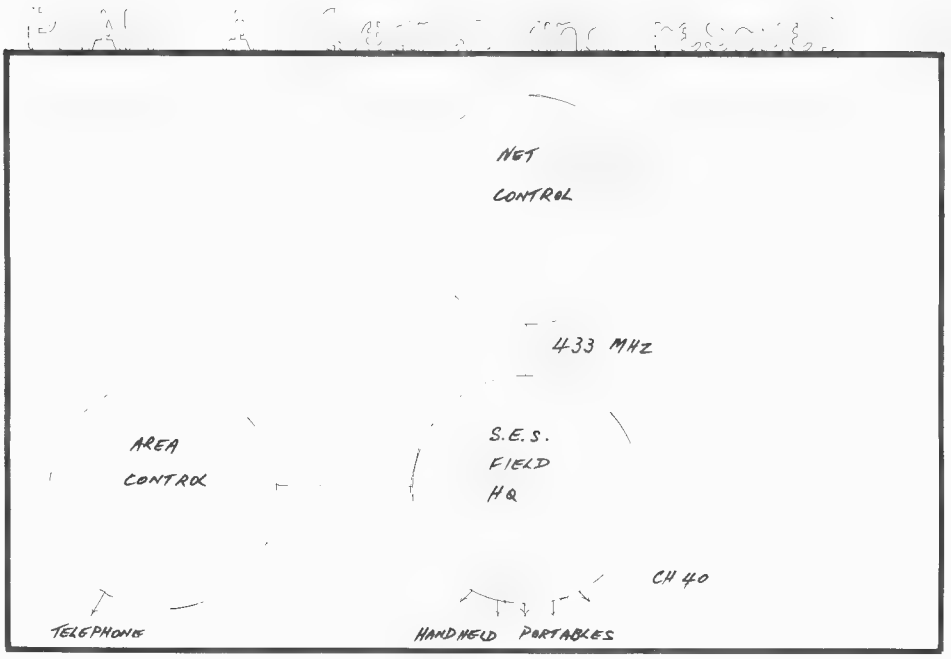
A: Search and Rescue (with the State Emergency Service).

B: Limited Emergency (severe storm, wind or minor flooding).

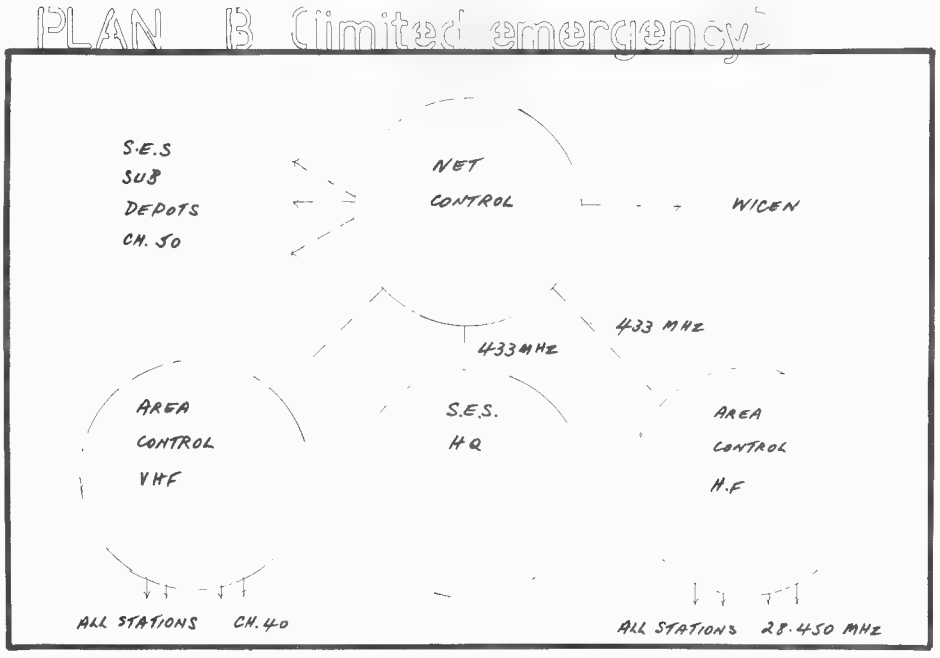
C: Full Emergency (cyclone, tidal surge or earthquake).

Each of the above plans has a different deployment of personnel and frequencies. All 15 hard core amateurs carry a red folder in which are the three plans, call-out procedure and deployment.

The network is controlled by NET CONTROL (VK4KD), who is situated on a hill, well above flood level and pretty well cyclone proof. This station is equipped with emergency power, emergency food and water supplies and first aid kits. It is therefore capable of continual operation for a considerable period under severe conditions.

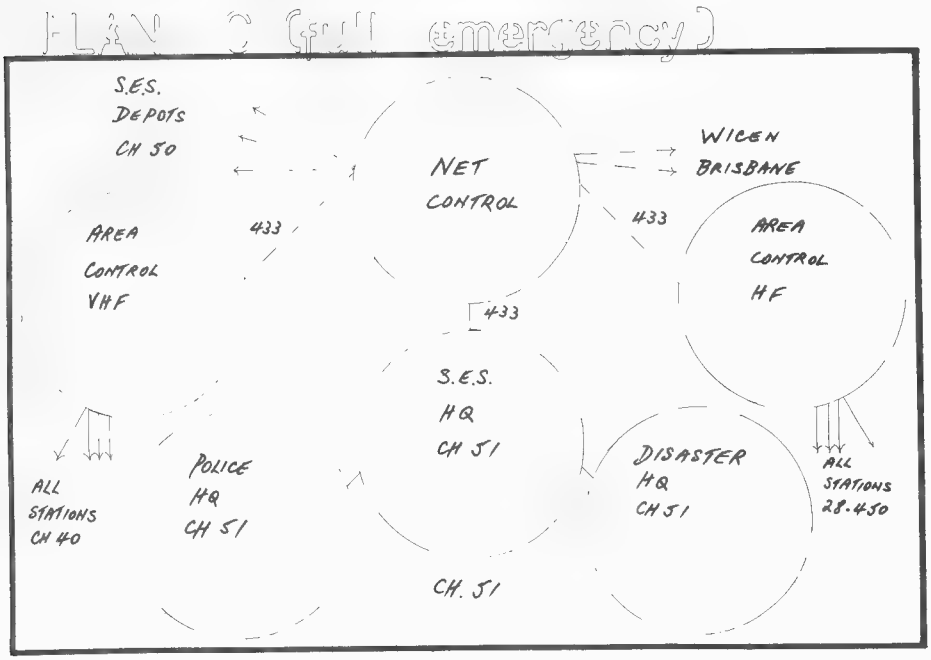


PLAN A



PLAN B

To cater for the many individual stations of this 50 mile strip, two AREA CONTROL stations were included. One, VK4TN, maintains contact with the many 2m mobiles and base stations, the second, VK4NJK, is responsible for the many Novice stations on 28,450 kHz. Both these stations are linked to NET CONTROL. This takes care of "situation reports" coming in from the whole area, the information or messages are passed to the "OFFICIAL" stations by NET CONTROL.



PLAN C

OFFICIAL STATIONS

By this is meant any station of the network who is responsible for communications to either the State Emergency Headquarters, Police Headquarters, Disaster Headquarters, Meals on Wheels, etc. Study of the plans will show that, say in a full cyclone, the SES can be linked direct with the Police or Disaster HQ on their own frequency (Ch. 51) or can route a message through NET CONTROL to any area on the coast or into the national WICEN network.

Here on the Coast we have the State Emergency Headquarters located in Southport, and three other sub-depots, Coolangatta, Burleigh and Mudgeeraba. All these are linked together through our network.

Exercises are carried out on the first Monday of each month and field exercises, in conjunction with the SES, from time to time.

This description of our own local arrangements may be an incentive for other areas to form local groups with a link into WICEN if necessary. ■

She's a Beaut, Mate!

Ron Petrich VK4ACZ
22 Amethyst Street, Bayview Heights, Cairns 4870

If you have to ask "what is?" you obviously haven't been to the far north of Queensland this year, for 1980 is the year of VK4RCA, the Cairns 2 metre repeater. Declared operational on 24th January, 1980 at is permanent location atop Mt. Bellenden Ker, VK4RCA has dramatically extended two metre activity in the far north of Queensland. Contacts have been made with mobile stations as far south as Mackay and as far north as Cooktown — the distance between these two places being of the order of 400 nautical miles (740 km).

So she's a beaut all right — in fact, she's too much of a beaut! Because of the range of VK4RCA, interference to two metre repeaters at Port Moresby and Mackay, both of which are also on Ch. 8 (7000), will undoubtedly cause problems. Consequently, consideration is being given to a frequency change for the Cairns repeater. (Probably Ch. 6950.)

Mt. Bellenden Ker is 5200 ft. high — only marginally less than Queensland's highest mountain (Bartle Frere) and barely a whisker less than Mt. Ginini, which carries Australia's highest amateur repeater. Before anyone protests that we are 80 ft. short of joining the mile high (repeater) club, we should mention that our antenna is 150 ft. up the Telecom mast, consequently our antenna height is 5350 ft. above sea level.

During the time which elapsed between March 1977, when the project was first proposed, and January 1980, a number of possible sites were considered, but the Club's repeater sub-committee, headed by Nick VK4YT (who first suggested that the Club build a repeater), had always been keen on Bellenden Ker, or BK as it is known locally.

BK has many advantages, height being only one of these. Among the others are power availability and security. The Telecom installation on BK houses the transmitters for the two Cairns TV stations, consequently mains power as well as emergency power is available.

Access to the site is by cable car, operated by Telecom, and the terrain over which the cable car passes on its ascent is not only rugged but is jungle/rain forest covered. It is possible to walk or climb up the mountain by foot but one would need to be highly motivated to do so. Consequently, the mountain top does not attract casual sightseers, etc.

It was recognised that the chances of obtaining Telecom approval to use their site for our repeater were slim indeed and it could be said that our initial approaches received anything but encouragement. But the enthusiasm of the RSC was contagious and the Club continued to pursue their goal. Many letters were exchanged between the Club and Telecom and ultimately approval was given — but it carried an annual price tag which exceded the Club funds — which had taken years to accumulate. It was obviously unacceptable to members that the Club should commit itself to an annual debt which far exceeded the Club's income, present or future. So the paper war continued. We were fortunate that around this time we were able to put our case, in person, to the Telecom Commissioner from North Queensland who had been newly appointed and who was to represent the interests of residents of the far northern areas of Australia. Our case received a sympathetic hearing and, although some time was still to pass before finalisation, Telecom reviewed the situation and offered the Club an attractive agreement. Although initial costs were relatively high for a small Club, the yearly charges were well within our modest means. Needless to say, the Telecom offer

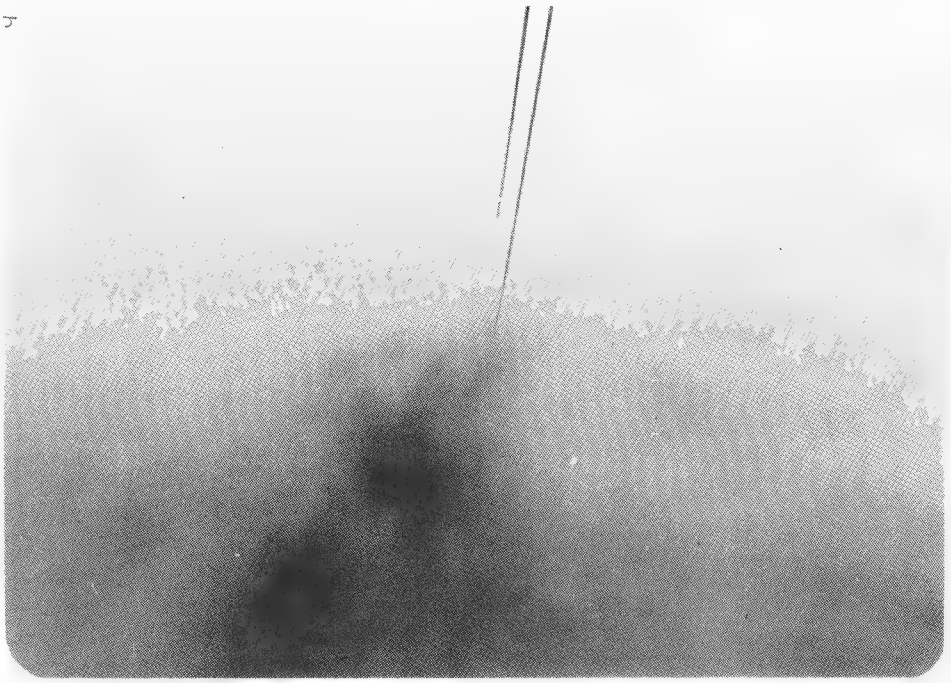
was gratefully accepted. It then became a matter of speeding up activities to complete our end of the project so that Telecom would be able to finalise their part of the activity, such as attaching our antennas to the tower before all work was brought to a stop by the wet season. Tied to this also was the impending departure of Ian VK4AWB, who had carried the responsibility for the technical aspects of the repeater.

Last minute delays caused by antenna problems, people being unavailable due to Christmas/New Year holidays, etc., caused many a hiccup but, although it rained heavily for a few days early in the New Year, the wet hasn't eventuated. All the loose ends came together and on 24th January VK4RCA was on air live from BK. It seemed that every amateur in Cairns who had 2m gear either had it at work with him or had taken a "sickie". Two metres was never so active! Results on that and subsequent days exceeded expectations and it was very pleasing that when Ian VK4AWB left Cairns for Brisbane a day or so later, he was able to maintain two-way communication from his car with amateurs in Cairns virtually throughout the drive to Townsville.

The Cairns area and surrounding countryside is notorious for difficulties with VHF communication — including TV. The number of translators serving the surrounding area is high and the problems rate a mention in the book "The Australian System of Antenna Craft" by Bob Thompson. It was therefore very gratifying to Club members to be able to demonstrate to State Emergency Service officials how mobile stations operating with low power could communicate with each other and with the Club station, which in fact is housed in the Cairns SES HQ building. Using a hand-held two metre transceiver, Club members worked mobiles in areas previously in shadow — locations such as the Barron River Gorge, where the only way out is straight up!! and stations on the Tablelands, which could only communicate through isolated "windows" to the coast without the repeater.

Provision has been made to link VK4RCA with the Townsville repeater VK4RAT and a Yagi has already been attached to the Telecom tower for this purpose. When this phase is completed, solid coverage in those areas which are noisy at present is expected.

If there is any moral to be drawn from all this, it must surely be that perserverance pays off and that while setbacks are certainly discouraging, they need not be allowed to colour the argument or divert the effort of achieving the goal. To other Clubs in the same position as our own with limited finances, may we urge patience and perseverance. We would have achieved only limited improvement to 2 metre coverage in our particular area, with its terrain problems, had we not been able to site our repeater on the top of Bellenden Ker. ■



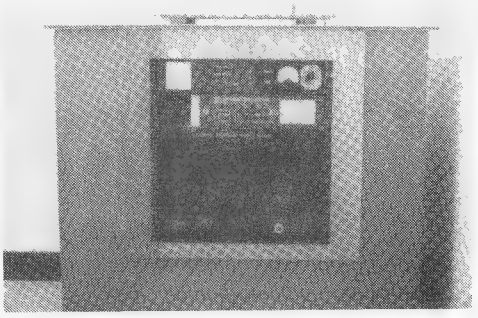


PHOTO 1 (below): A view of the VK4RCA Cairns repeater attractively housed in its cabinet. The repeater location is however unattractive to sightseers. PHOTO 2 (above) shows the cable car supports barely visible from the low cloud near the mountain top.

The technical details:

LOCATION	:	Mt. Bellenden Ker 17° 15′ S 145° 40′ E
TRANSMITTER	:	Modified STC 151 Hi-Band, 25 watts output
RECEIVER	:	Modified Pye MVF-516, 0.4 uV for 20 dB quieting
ANTENNA	:	Cushcraft G6-144 6 dBd gain. Vertical
(Channel) FREQUENCY	:	7000 (146.40 in, 147.00 out)
ELEVATION	:	5350 feet (1630 metres)
EFFECTIVE RADIATED POWER	:	35 Watts
TIME OUT	:	4 Minutes
PRACTICAL MOBILE COVERAGE	:	150 km
CONTROL CIRCUITRY	:	Solid state TTL, with design by Ian VK4AWB and ideas borrowed from Mt. Ginini and Adelaide repeaters.

DO IT ELECTRICALLY

When Milli Ampere first saw Volt
  Her charms past all resistance.
A spark coiled in his heart poor colt —
  He needed prompt assistance.
And she, tho plighted to old Watt,
  Could alternate affection,
So let her eyes bolt glances hot,
  Right in poor Volt's direction.
The current of Watt's wrath flowed strong!
  He vowed Volt should not meter.
For daughter Poly Phase had long
  Hoped that Volt would be sweeter
And so to Milli Ampere, he
  A stern note did transmitter,
Requesting she transform, and be,
  If possible, less bitter.
So Milli Ampere flirted not,
  But knew that it was wise
To regulate the rage of Watt
  And with him synchronize.
Then Volt with Poly Phase did fuse —
  From her he did not roam.
They recitified divergent views
  And started a small Ohm.

W. F. Legget in Western Electric News, 1919. ■

COLLECTORS' CORNER

No. 2 — The Yaesu FRG 7

This month in Collectors' Corner, we feature the Yaesu Musen FRG7, an analog frequency reading receiver which has enjoyed considerable popularity since its introduction in 1976.

PHOTO 1: Front view of the Yaesu FRG7 receiver.

The FRG7 is an all solid state synthesised triple conversion superheterodyne communication receiver designed to cover the entire high frequency spectrum from 500 kHz to 29.9 MHz. This receiver was one of the first to incorporate the "Wadley Loop" principle utilizing a synthesised heterodyne oscillator for excellent stability.

Good selectivity is provided for SSB, AM and CW using a ceramic filter in the 455 kHz IF circuits, while a tone switch on the front panel of the FRG7 provides varying audio response in any one of three ways.

In the normal position, the audio amplifier passes frequencies of 250 Hz through 3000 Hz, at narrow 400 Hz through 2500 Hz and at low 250 Hz through 1500 Hz.

Early models of the FRG7 did not incorporate any means of varying the received frequency other than by adjusting the main tuning dial, a rather hazardous manouevre when trying to remain on a particular frequency accurately.

(continued on page 28)

SPECIFICATIONS

Frequency Range:
0.5 MHz ~ 29.9 MHz

Type of Emission:
AM, SSB (USB or LSB), CW

Sensitivity:
SSB/CW: Better than 0.7 μV at S/N 10 dB
AM : Better than 2 μV at S/N 10 dB

Selectivity:
±3 kHz at −6 dB, ±7 kHz at −50 dB

Stability:
Less than ±500 Hz at any 30 minutes after warm up

Antenna Impedance:
High impedance for 0.5 MHz ~ 1.6 MHz
50 ohm unbalanced for 1.6 MHz ~ 29.9 MHz

Speaker Impedance:
4 ohms

Audio Output:
2 watts

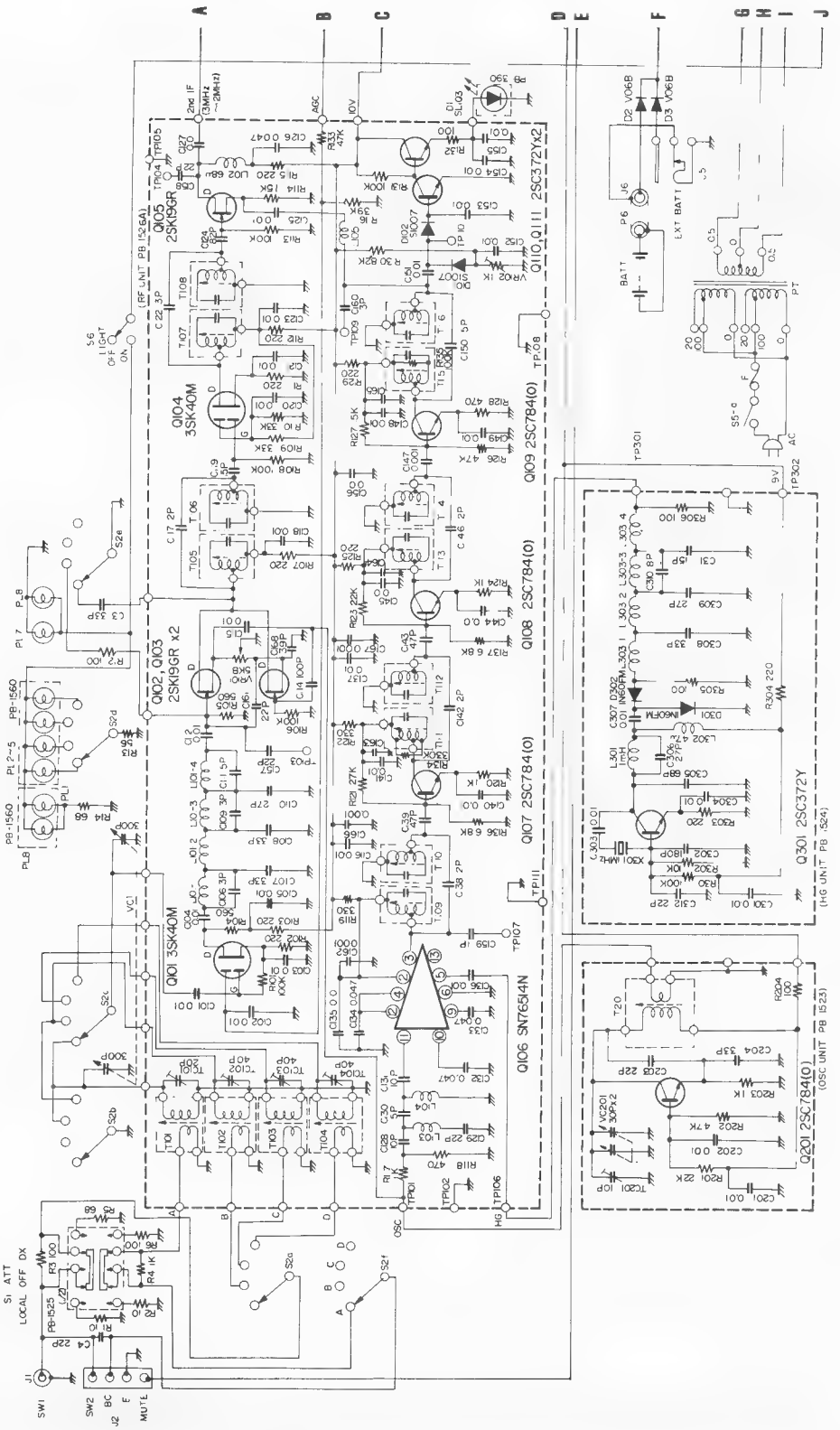
Power Requirement:
100/110/117/200/220/234 volts AC 50/60 Hz, 12 volts DC external or internal dry cell UM-1 x 8

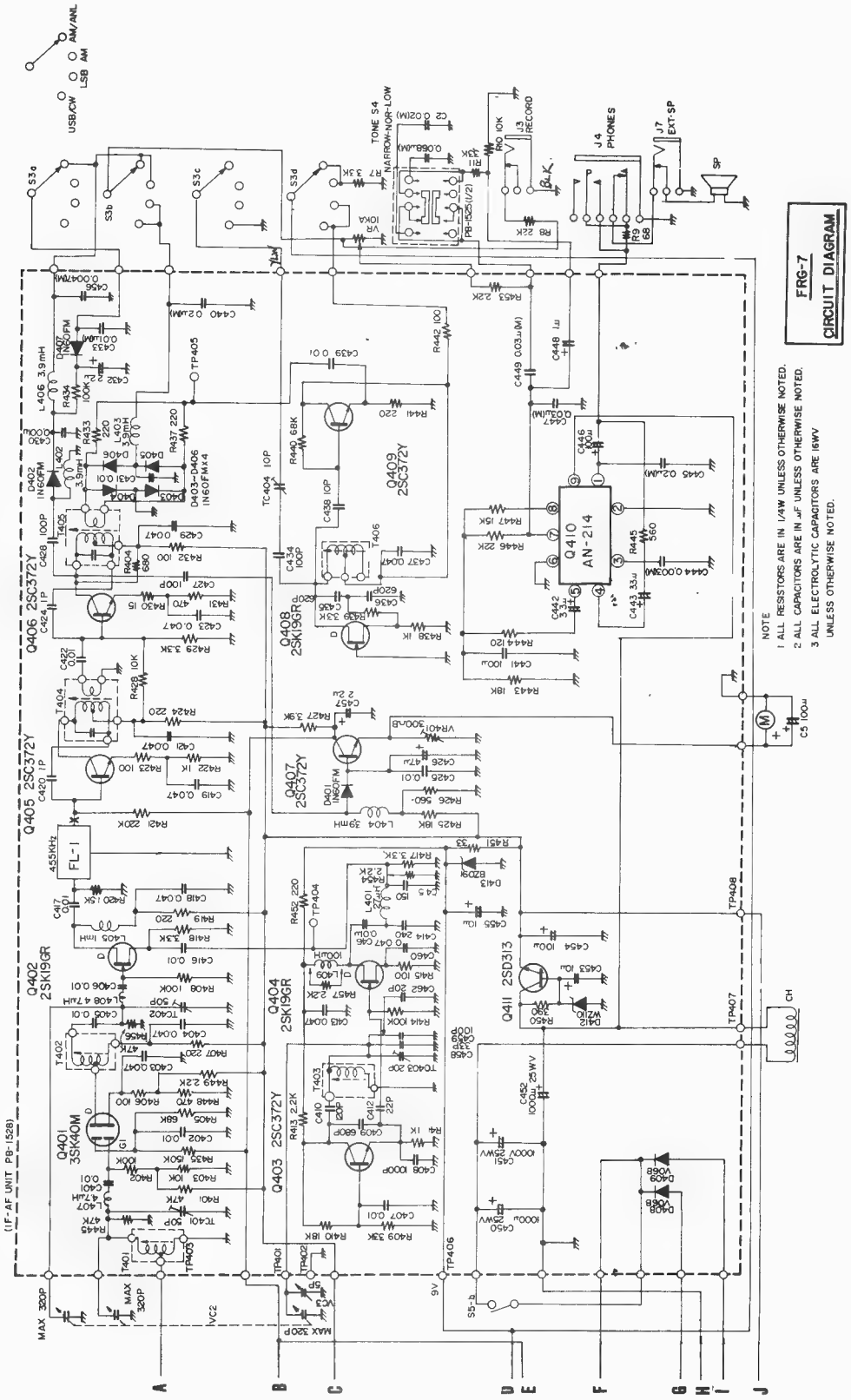
Power Consumption:
AC 14VA

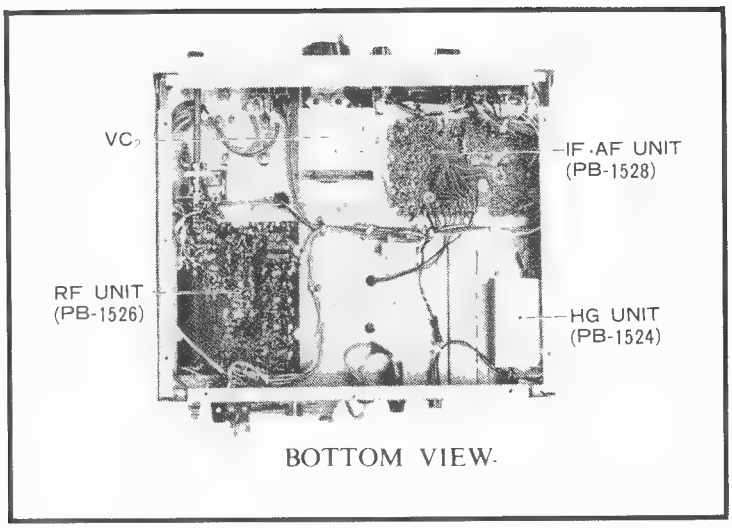
Size:
340 (W), 153 (H), 285 (D) mm

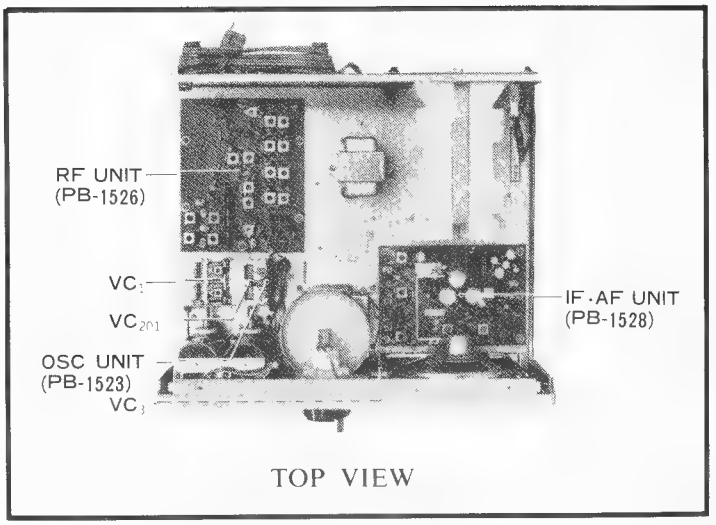
Weight:
Approx. 7 kg without batteries

FRG 7 Circuit Diagram




FRG-7
CIRCUIT DIAGRAM
NOTE
1 ALL RESISTORS ARE IN 1/4W UNLESS OTHERWISE NOTED.
2 ALL CAPACITORS ARE IN μF UNLESS OTHERWISE NOTED.
3 ALL ELECTROLYTIC CAPACITORS ARE 16WV UNLESS OTHERWISE NOTED.
(IF-AF UNIT PB-1528)
Q401 3SK40M
Q402 2SK19GR
Q403 2SC372Y
Q404 2SK19GR
Q405 2SC372Y
Q406 2SC372Y
Q407 2SC372Y
Q408 2SK19GR
Q409 2SC372Y
Q410 AN-214
Q411 2SD313
FL-1
455KHz
J3 RECORD
J4 PHONES
J7 EXT-SP
SP
TONE S4
NARROW-NOR-LOW
AM/ANL
LSB AM
USB/CW





(continued from page 25)

PHOTOS 2 and 3 (above and left): Views of the FRG7 internally. HG unit — harmonic generator.

Later models of the FRG7 incorporated receiver incremental tuning (RIT). This feature consisted of a 5 pF variable capacitor wired in parallel with the main VFO tuning capacitor, thus providing a means of netting on stray stations in a net or for listening either up or down without shifting the main dial from a frequency required.

Like most receivers the FRG7 provides the listener with a headphone jack for private listening, together with a record output jack for those wishing to preserve transmissions heard for posterity or perhaps to provide an amateur with an accurate appraisal of his transmissions. The output level is kept constant at 50 mV regardless of the setting of the FRG7 volume control.

In any receiving station the antenna is perhaps the most important tool to the SWL. The FRG7 will readily accept a balanced 50 ohm line for listening with an antenna resonant at a particular frequency, or random wires may be connected via two terminals at the rear of the unit for use on Short Wave frequencies or for monitoring broadcast stations on Medium Wave. A MUTE facility is also provided to disable the receiver while transmitting.

The FRG7 includes a self-contained three-way power supply for 100/110/117/200/220/234 volts AC 50/60 Hz, an internal battery or external 12 Volt DC. If the AC power source fails, the unit switches automatically to an internal battery which uses eight UM-I cells. The receiver is ideally suited for home or portable use. To save battery consumption, the dial lamps can be switched off. Cells for the internal battery arrangement are not included when purchasing an FRG7.

For modifications to the FRG7 prospective or current owners are advised to read Amateur Radio, March, 1977, page 21, and Amateur Radio, March 1980, page 18.

For further information on the FRG7 contact Bail Electronics, 38 Faithful Street, Wangaratta 3677. Ph. (057) 21 6260 or any of their authorised distributors. ■

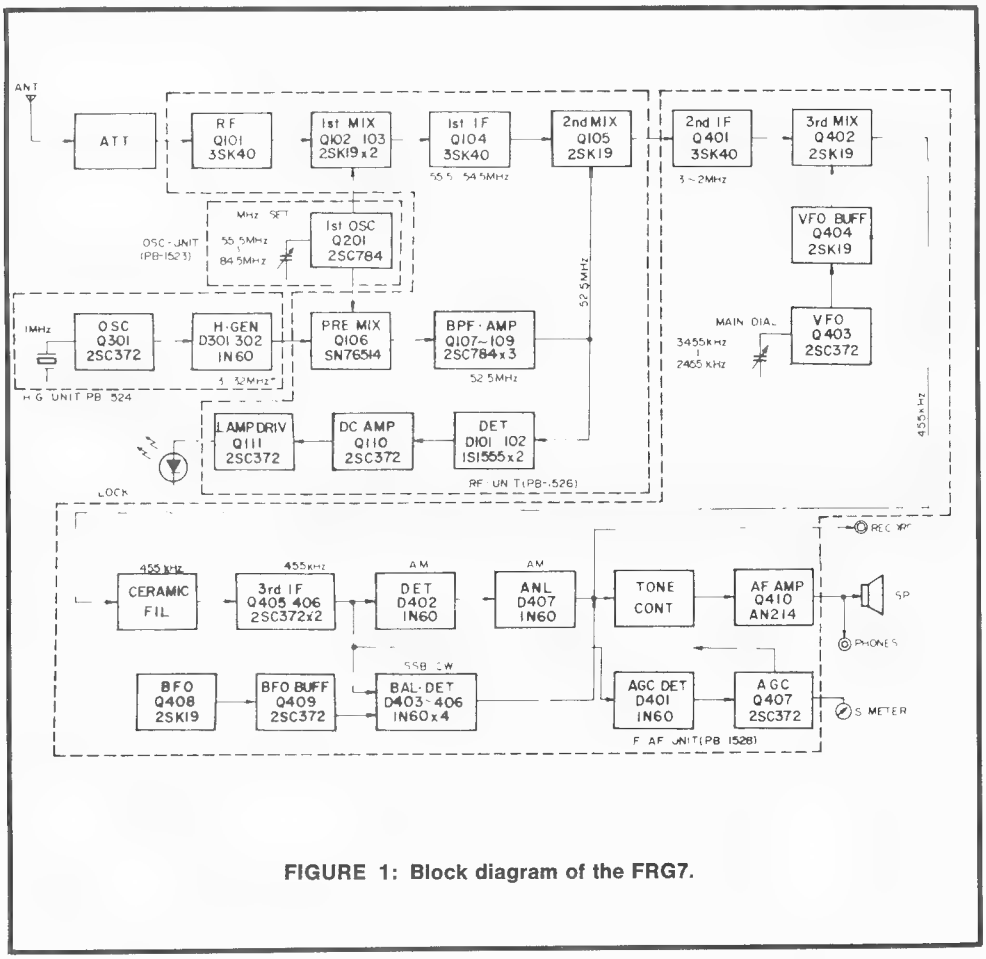


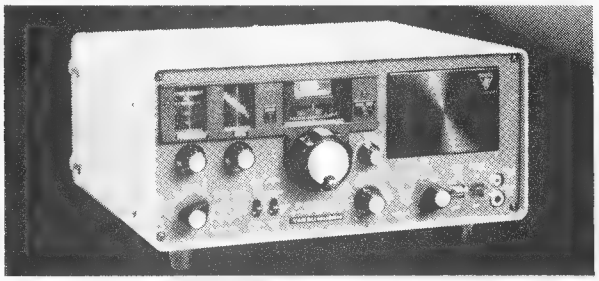
FIGURE 1: Block diagram of the FRG7.

MORSE EXAMS

Candidates for morse exams are specially reminded that the morse sending or receiving of letters is not adequate in itself. There is a space of 7 dots between words and this has to be observed so that whatever is sent or written down should be in understandable composition English. Thus, to omit a space between two words is one error. Many errors could be recorded against you if, for example, in receiving morse, you write down a string of letters not separated into discrete words. This reminder is given to dispel any rumours to the contrary and to alert candidates to the official requirements. ■

YAESU FRG-7 COMMUNICATIONS RECEIVER

The FRG is a precision-built high-performance communications receiver, providing coverage of the MF and HF bands from 0.5 MHz — 29.9 MHz. Its modern technology and convenience features bring you versatility and performance you'd expect only on much-higher-priced equipment. For many hours of satisfying shortwave listening, build your station around the FRG-7.



RELIABLE PERFORMANCE
The Wadley Loop System (drift cancellation circuit), coupled with a triple-conversion superheterodyne system, guarantees high sensitivity with rock-solid stability.

10 KHZ DIRECT DIAL READOUT
The extremely stable VFO, equipped with a precision dial mechanism, permits 10kHz direct dial readout. Thus, you can preset the dial to the desired station with the assurance of being "on target". In addition, a fine tuning control allows precise zeroing on stations under crowded conditions.

RF ATTENUATOR
The selectable three-position RF attenuator is effective for minimizing interference caused by strong adjacent-channel stations. Choice of DX, LOCAL, or OFF is provided.

EXCELLENT SELECTIVITY
The ceramic filters used in the FRG-7 guarantee sufficient bandwidth, while providing high selectivity for rejection of unwanted interference.

ALL MODE RECEPTION
The FRG-7 allows reception of all commonly-used modes on the MF and HF bands: SSB voice, AM broadcast, and CW Morse Code transmissions

AUTOMATIC NOISE SUPPRESSION CIRCUIT
When impulse-type noise is experienced, the AM/ANL mode may be selected, activating the automatic noise suppression circuit, thus minimizing the offending noise during AM reception.

THREE POSITION TONE SELECTOR
The audio spectrum in voice communications is limited to the range of 300 Hz — 2700 Hz. Broadening the audio bandwidth will introduce noise or other interference. The tone selector in the FRG-7 will limit the audio spectrum, thus increasing the readability of voice signals being received. The operator may select LOW (high cut), NORMAL, or NARROW (high and low cut).

AC/DC OPERATION
The FRG-7 can be operated from AC, DC, or internal batteries (using optional battery holder). When more than one power source is connected, the FRG-7 will automatically select the most economical source. In addition, a front panel switch will turn off the front panel lamps to conserve energy. For portable operation, a line cord retainer helps maintain an orderly station.

YAESU

FT-720R VHF/UHF FM TRANSCEIVER

ADVANCED PLL TECHNOLOGY

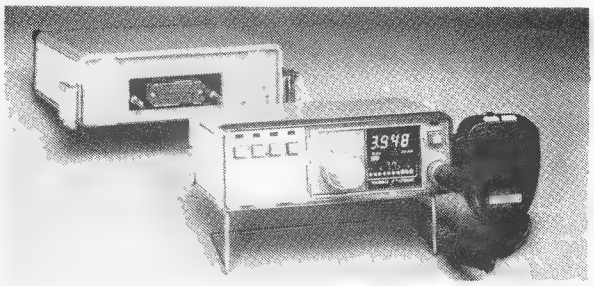
FEATURES:

CHOOSE YOUR FAVOURITE BAND
The FT-720R Control Head may be used with either the FT-720V 2 Meter RF Deck or the FT-720U 70 cm RF Deck

OPTIONAL CONTROL BOX
The S-72 control box option will allow you to connect the control head the 2 meter RF Deck and the 70 cm RF Deck together, thus enabling you to choose the desired band is simply by throwing one switch!

SCANNING
Fingertip controls on the microphone provide instant up/down scanner control The scanner may be programmed to stop on a busy or clear channel, if you wish

FIVE MEMORY CHANNELS WITH PRIORITY FEATURE
As many as five memory channels may be programmed, for instant return to a favourite repeater or simplex channel. One of the memory channels may be used as a priority channel, as well and the microprocessor will then search between the priority channel and your main dial frequency!



SPECIFICATIONS:

	FT-720RV	FT-720RU
Frequency coverage:	144.00—147 99 MHz 144.00—145.99 MHz	430—439.975 MHz 440—449.975 MHz
Synthesizer steps:	10 or 12.5 kHz	25 kHz
Power output:	10 watts (RV model) 25 watts (RVH model)	10 watts
Receiver type:	Double conversion superheterodyne	Double conversion superheterodyne
First IF:	10.7 MHz	16.9 MHz
Second IF:	455 kHz	455 kHz
Sensitivity:	0.32 uV for 20 dB quieting	0.5 uV for 20 dB quieting
Selectivity:	±6 kHz (—6 dB) ±12 kHz (—60 dB)	±12 kHz (—6 dB) ±24 kHz (—60 dB)
Power requirements:	13.8 VDC, negative ground 13.6 VDC (RVH model)	13.8 VDC, negative ground
Current consumption:	Approx. TX 3.5A (RV model) TX 6.5A (RHV model) RX 0.5A	Approx. TX 4.5A RX 0.5A
Case size:	150(W) x 50(H) x 247(D) mm	150(W) x 50(H) x 247(D) mm
Weight:	Approx. 2.5kg	Approx. 2.5kg

Specifications subject to change without notice.

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bail

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38 FAITHFUL STREET, WANGARATTA
Telephone: (057) 21 6260 — Telex: AA 56880
DISTRIBUTORS AND AGENTS IN ALL STATES

A Look at the John Moyle Memorial Field Day Contest 1980

Peter Wilkinson VK6YW
For the 2nd Busselton Scout Amateur
Radio Club VK6TJ.

The 9th of February had arrived and we, the Second Busselton Scout Amateur Radio Club, should have been prepared for the John Moyle Contest. We had talked about the oncoming event but could not somehow manage to get things together; most members seemed to have problems of their own and the contest seemed so far away.

Alas, the day had arrived and nothing had been planned. The junior members would have to return to school on the coming Monday and it was uncertain if they would be able to camp out for the weekend. The weather in the south-west corner of WA had been very hot and a change was imminent.

On the Saturday morning some of the senior members met to see what could be done; with only a couple of hours to go we decided to try and get the Club operating portable. The lighthouse at Cape Naturalist would have been the ideal spot, but as the weather was changeable we decided that Signal Park, near the jetty, would be the better choice, with most amenities not far away. Signal Park was named from the old days when signals were sent to and from sailing ships tied up at the Busselton jetty.

We arrived at Signal Park, a mixture of cars, trailers, bicycles and tents, not to mention all the other bric-a-brac. It certainly seemed for a while that we would never get on the air. Ted Davies VK6ED and a junior member, Wayne, made up a G5RV and, after picking out two suitable trees, soon had the antenna up. Another member, Gordon Strong, positioned the 4 kW portable generator some distance away, whilst Terry Mitchel VK6ZAU and myself VK6YW were struggling with a tent. After erecting an old 23 ft. sailing mast, my newly constructed spider quad, then untried, looked very impressive lashed on the top.

The big moment had arrived and we were ready to go. The genny was switched on and the FT101E (which the Club was able to purchase after an extensive fund-raising campaign last year) burst into life. We were late starters and it was some time around 1700 hrs. when we received our first contact. Excitement was high and so was the wind, and a few drops of rain fell, but not enough to dampen our enthusiasm. In between gulps of tea and mouthfulls of biscuit we started logging the numbers. As this was an outdoor exercise we decided to let the public know of our efforts, and a sign was erected on the nearby road.

We were very surprised at the interest in our activity and spent quite a deal of time explaining to people about amateur radio and the event. I feel certain we have aroused some interest in would-be amateurs, apart from a considerable number of shortwave listeners who made themselves known to us. We had a surprise late in the evening when our local MLA, Barrie Blakie, stepped into the tent and passed some time with us. He was very impressed with all the action at hand.

Late in the evening the remaining junior members, Glen and Wayne, retired to their sleeping bags, while Ted and Terry carried on through the night, doing most of the operating. By 2.30 a.m. local time the bands were very quiet and very few contacts were made from then until morning.

The morning came with a very cold change and very little wind. I took over the operating and picked up quite a few contacts on fifteen and ten metres. It was very frustrating at times when some VK amateurs would come up and ask what the contest was about, and we lost extensive time explaining. We also felt disappointed in the number of WA participants. More people could have made the effort and participated. However the day progressed well, with junior members setting up our 2m channel 6 rig (converted car phone

PHOTO 1 (above) shows a general view of the camp at Signal Park, while PHOTO 2 (right) gives a view of the Homebrew Spider Quad for use on 10 metres.

Terry had put together), which did manage to get into the repeater at Bunbury with a home brew beam lashed to my car. Although this was not used in the contest it was useful for having a chat with local amateurs and good practice for the junior members, who hope to sit for the exam this year.

We finished the last contacts with Terry using the spider quad and a converted CB rig on 10m which proved itself to be a very useful antenna in spite of the SWR which was about 3 to 1.

When the last contact had been logged and the guy wires loosened, all the members and some enthusiastic relatives gave a hand to pack all the gear away and clean up the area.

PHOTO 3 (left): Terry VK6ZAU operating on 10 metres with the Spider Quad about an hour before closing down. Roger Mularky is sitting in the foreground straining his ears.

Although our Club is small, with only seven or eight active members and although we knew we wouldn't win the contest, we all felt the exercise was worth while and as the rain began to trickle down our plans for next year were beginning to form. ■

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Meanwhile, in the quiet surroundings at Whipstick Forest, about 15 km north of Bendigo (Vic.), Bob VK3BRL and XYL Barbara scored well over 1000 points in the six hour phone section.

At left, the site of operation showing the generator well away from the camp site and at night Bob notched up more points!

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Further south, the Geelong Radio and Electronics Society made the 1980 John Moyle Field Day a family affair and managed to improve their score as compared to previous years.

The happy group (at left) after their most enjoyable family day.

PENSIONERS

ONLY YOUR DIVISION CAN APPROVE RE-GRADING TO PENSIONER STATUS — PLEASE APPLY TO YOUR DIVISION IF YOU BELIEVE YOU CAN NOW QUALIFY.

NOVICE NOTES

Edited by Ron Cook VK3AFW

The sharp-eyed reader will have noticed a change; this section of the magazine now has an editor. The aim is to include additional material specifically for the novice and other newcomers to amateur radio. It has been suggested that up to one-third of the readers of AR have a novice licence or have been involved in amateur radio for less than two years. Although much good material for these readers arrives in the AR mail there is an unsatisfied demand for simple articles on specific topics. Often we have heard "Why don't you guys (on the Publications Committee) write an article on topic X or topic Y?". Until the recent re-organisation of the AR production team there simply was not enough time.

Of course no one person, especially this editor, can write on all topics. Readers' contributions are therefore still required for this column. Indeed they are vigorously encouraged.

Topics to be covered in the coming months will include: building and using simple test equipment; small base and mobile antennae; the truth about VSWR. These articles will include readers' contributions, some theory not given in common texts and some constructional details.

Now that the introductory comments have been completed let us commence. To prepare the ground for following articles we start with a discussion on construction of simple equipment.

BUILDING YOUR FIRST PROJECT

What to build

For your first project it is obvious that you must choose something simple. A small Dick Smith kit would be a wise choice. Next a more complex kit such as one of the Josty Kits from Vicom. You can then proceed on to making up items described in this magazine and perhaps eventually build your own transceiver. Remember the acorn and start small.

PHOTO 1: The handyman's shadowboard. A place for everything and everything in its place.

THE WORK AREA

Before commencing you must organise a clear working space. Initially you will only need an area about 1m by 0.5 m. This may be a workbench or the kitchen table. I have used a folding card table on occasions. It is wise to cover the work area with a sheet of rubber or linoleum or even several sheets of newspaper. This prevents damage to the equipment and the table. A comfortable stool is also required. An ordinary chair is too low and will cause back ache. The stool should for preference have a back for support and be of such a height that your lower arm is horizontal when working at the bench.

An untidy work area is a source of frustration and can cause accidents. The only way to keep the area tidy is to have a storage place for all tools and parts and to return everything to its right place at the end of each session. Hand tools, particularly those with cutting edges, are better hung on a "shadow-board" rather than being tossed on the bench or even in a drawer. Cutting edges are easily blunted by contact with other tools. Photo 1 shows a handyman's shadow-board. The tools are hung from nails driven into a vertical sheet of chipboard or heavy plywood. The outline of the tool is drawn on the board after giving the board a coat of white paint.

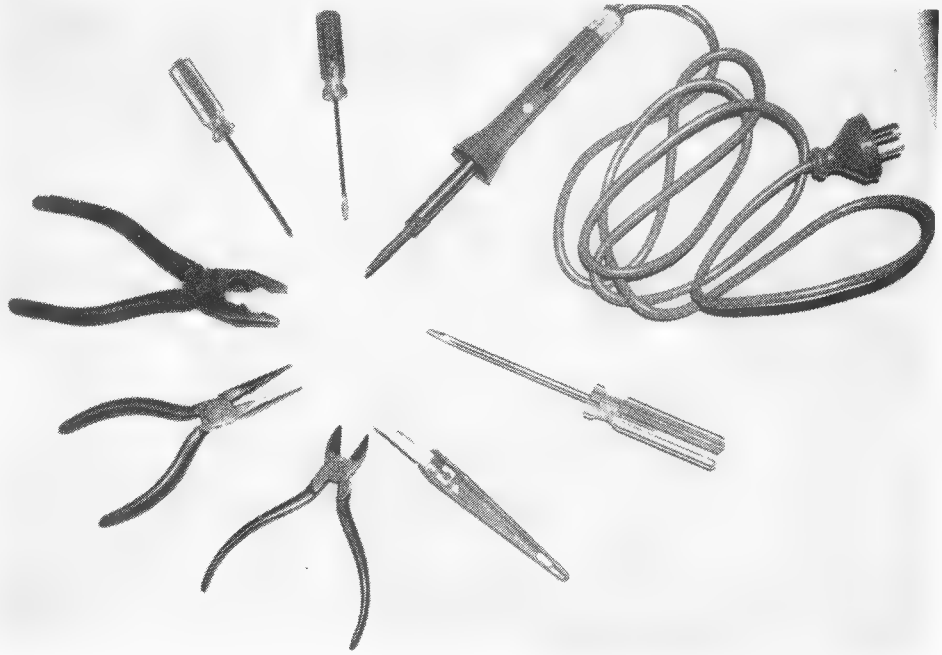


PHOTO 2: Hand tools for the beginner.

This is invaluable for locating missing tools and for helping in replacing tools in the right place. Although the lines are not visible in the photograph they are there. If you wish, the area enclosed by the line can be painted in in a dark colour to produce a "shadow" of the tool.

TOOLS YOU WILL NEED

Now what tools will you need? Photo 2 shows the minimum requirement for most kits. Starting at 2 o'clock and proceding clockwise we have a soldering iron (see later), a medium sized screwdriver (5 mm blade), a sharp knife, small side cutters (15 mm cutting edge), small long nose pliers (25 mm jaws), Philips head screwdriver (3 mm blade), small screwdriver (2.5 mm blade).

GETTING READY

Before starting, read the instructions carefully at least once. Omitting this simple and obvious step may cause much grief later. Check that you have all the parts required. For some kits a little drilling and other mechanical work is required — this should be completed before any wiring commences.

Sort out the components so that they are easily located when required. An egg carton is a very useful temporary storage bin for capacitors, resistors, transistors, etc. If you are unsure of the coding used for resistors and capacitors check your copy of the ARRL Handbook or a Dick Smith catalogue.

SOLDERING

Most electronic circuits use components soldered on to a printed circuit board. As the solder provides both electrical and mechanical connections the quality of the soldering is most important. Perhaps the most common faults in otherwise properly assembled circuits are "dry" or electrically open joints and unwanted solder connections called "bridges" or "tracks" between adjacent conductors. If you have not had any experience in soldering get some practice before going any further. Twist two bare copper wires together for about 20 mm and practise the technique described here. Cut the joint out, retwist the wires together again and resolder. Repeat until you can make a satisfactory job.

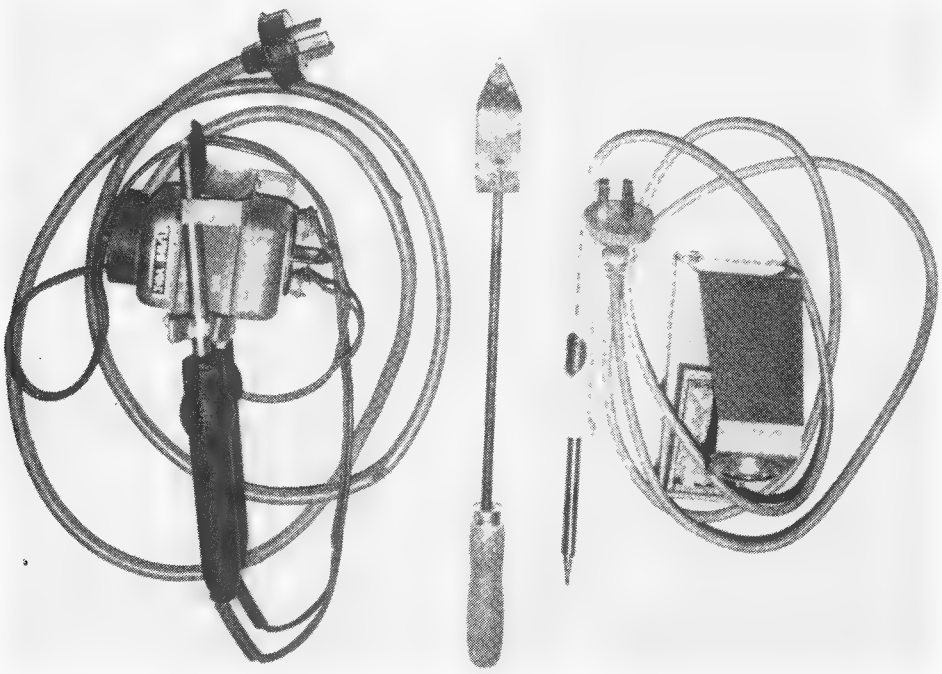


PHOTO 3: Soldering irons for transistors, leaky guttering and valve wiring.

THE SOLDERING IRON

The choice of a soldering iron is an important matter. A small 25 watt electric soldering iron with a 1.5 to 3 mm wide chisel tip will be the most useful. Photo 3 shows three different types of soldering iron. The iron on the left is a temperature controlled type complete with stand and wiping pad. The advantage of this type is that it provides just enough heat, and no more, to melt the solder even if the type of joint varies from hair thin wires to tinplate. It is really equivalent to having a 10 watt and a 20 watt and a 40 watt and a 60 watt iron, all in one. In fact the performance is better than having all four separately. If your budget is fairly elastic this type of iron should be seriously considered.

The iron in the centre of Photo 3 is a plumber's delight. It is heated on a blowlamp and used to solder water tanks and car radiators. If that is what you want then that's fine, but don't use it, or anything that looks like it, on printed circuit boards. Even the fibreglass laminate boards are not plumbers special proof.

In the right-hand corner the old champion of thermionic valve days, the Scope quick heat iron. It has a rating of about 120 watts and is useful for heavy duty electrical work such as soldering to a steel chassis. It can also be used to peel off the copper track from printed circuit boards if you want to remove a link.

The soldering iron tip must be kept clean at all times. This can be done by firmly wiping the tip on a moist sponge before and after making each joint. The practice of dobbing a little solder on to the tip and then flicking off the excess is wasteful and messy.

There are two types of tip, one is solid copper and the other is plated steel or plated steel and copper. Plated tips must not be filed. If an oxide layer builds up on a plated tip this may be removed by wiping on a fine plastic scourer made for cleaning saucepans.

Solder will gradually dissolve a copper tip but not a plated tip. Savbit is a resin cored solder with copper added to reduce this action. When the copper tip becomes concave or pitted it should be "dressed" or filed to restore the flat chisel faces. A single-cut 6 in. file is suitable and available at most hardware stores. Don't forget to buy a handle. After dressing the tip it should be "tinned" by allowing it to heat up and then melting a little solder on to both tip faces.

SOLDER

Never use liquid soldering flux or soldering paste on electrical work. They are corrosive and they will produce as much corrosion as if you washed the circuit in battery acid. The stick of solder in the centre of Photo 4 is suitable for the plumber but not for you. The two spools contain 60/40 multicore solder. This is a solder with 60 per cent tin and 40 per cent lead around a core of resin flux. It is the most versatile solder for electronic work. Although it is more expensive I prefer the thinner solder for printed circuit work because it produces a neater joint and less tracks.

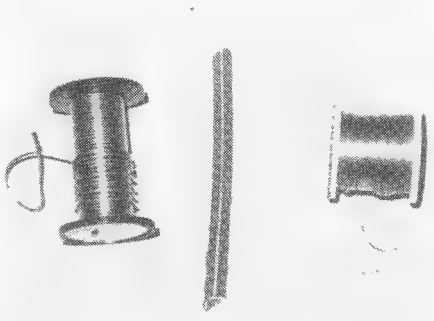


PHOTO 4: Three types of solder commonly used in radio applications.

SOLDERING TECHNIQUES

1. Check that the surfaces to be joined are cleaned and bright. If the surface is dull and oxidised rub gently with a hard ink eraser until it is shiny.
2. Carefully bend the lead of the components to be mounted with a pair of long nosed pliers so that the leads fit properly through the holes in the board. It is good practice to align the colour bands of resistors in a top-to-bottom and left-to-right orientation and to arrange other parts so that their value may be readily seen when fitted to the board.
3. After poking the leads through the holes, bend them to an angle of about 45 degrees to hold the part in place.
4. Check that you have the right part in the right place. If not you will very soon have to buy a de-soldering tool.
5. With the iron hot and the tip clean bring the tip of the iron into contact with both the copper track or pad and the component lead.
6. Quickly touch the solder wire to the lead and pad near but not touching the iron tip. If the solder does not melt within two seconds touch both the iron tip and the lead. As soon as the solder melts withdraw the solder and then the iron. Use the solder sparingly.
7. Do not touch the part or joint until the solder has properly solidified. The solder should have a smooth shiny appearance and the surface should make tangential contact with the copper pad and the lead wire. If the surface has a cracked or frosty appearance or is blob-like and has not wet the surfaces of the joint then it must be reheated until the solder melts and a little fresh solder applied. If this does not work the joint was probably not clean or was moved while cooling.
8. Cut off the excess lead wire with the side cutters.

ASSEMBLY

It is assumed that the first project requires little in the way of mechanical work. (This will be covered at a later date.) Mount any switches, potentiometers, etc., and connect the interconnecting wires as follows. The knife can be used to remove 5 mm of insulation and a 120 degree hook formed with the pliers. The hook can be passed through or around the terminal and squeezed tight with the pliers. This squeezing should be omitted if you intend to remove the wire on occasions, but remember that solder should not be relied upon to provide a strong mechanical joint. As a last point check that all parts are correctly wired. Swab off the resin with methylated spirits.

TESTING

Refer to the instructions for setting of the controls. In the absence of instructions or any obvious setting indicated by the circuit set the variable controls to mid-point. Connect the battery or plug the power cable in and switch on. If you have followed the guidelines in the instructions and these notes then there should be no signs of stress such as smoke, flames or frightful noises. In fact the set should show all the symptoms of a well behaved whatever-it-is. In later issues we will discuss fault finding. Hopefully you won't need to know about them for a while.

In the next issue we will continue with advice on building your own equipment. ■

VHF-UHF

An expanding world

Eric Jamieson, VK5LP

Forreston, S.A. 5233

VHF/UHF BEACONS

Freq.	Call Sign — Location
50.005	H44HIR — Honiara
50.020	GB3SIX — Anglesey *
50.023	HH2PR — Haiti
50.025	6Y5RC — Jamaica
50.035	ZB2VHF — Gibraltar
50.036	HC1JX — Quito
50.038	FY7THF — French Guiana
50.040	WA6MHZ — San Diego
50.048	VE6ARC — Alberta
50.050	ZS3E — South West Africa
50.055	ZL1UHF — Auckland
50.060	PY2XB — Sao Paulo
50.070	YV5ZZ — Caracas
50.070	VP9WB — Bermuda
50.080	W1AW — Connecticut
50.080	TI2NA — Costa Rica
50.085	WA6JRA — Los Angeles
50.088	VE1SIX — New Brunswick
50.089	WD4CEI — North Carolina
50.100	KH6EQI — Pearl Harbour
50.104	K4EJQ — Tennessee
50.105	KC4AAD — McMurdo, Antarctica
50.110	KH0AB — Saipan
50.110	AL7C — Anchorage
50.120	4S7EA — Sri Lanka
50.144	KC6IN — Ponape, Caroline Is.
50.498	5B4CY — Cyprus
51.999	YJ8PV — New Hebrides
52.200	VK8VF — Darwin
52.250	ZL2VHM — Palmerston North
52.300	VK6RTV — Perth
52.330	VK3RGG — Geelong *
52.350	VK6RTU — Kalgoorlie
52 400	VK7RNT — Launceston
52.440	VK4RTL — Townsville
52 450	VK2WI — Sydney
52.500	JA2IGY — Mie
52.500	ZL2VHM — Palmerston North
52.510	ZL2MHF — Mt. Climie
52.800	VK6RTW — Albany
52 900	VK6RTT — Carnarvon
53.000	VK5VF — Mt. Lofty
144.010	VK2WI — Sydney
144.162	VK3RGI — Gippsland
144.400	VK4RTT — Mt. Mowbullan
144.475	VK1RTA — Canberra
144 500	VK6RTW — Albany
144.600	VK6RTT — Carnarvon
144.700	VK3RTG — Vermont
144 800	VK5VF — Mt. Lofty
144.900	VK2RTX — Ulverstone
145.000	VK6RTV — Perth
147.400	VK2RCW — Sydney
432.400	VK4RBB — Brisbane

* Denotes new listing.

At last we can confirm official operation of the Geelong beacon on **52.330** from **Mt. Anakie** with **25 watts** to stacked cross dipoles, using the call sign **VK3RGG.** The Geelong boys have waited a long time for official sanction for the use of the beacon and I was pleased to receive a telephone call from Darrell VK3AQR recently confirming the news.

A DECADE ON VHF

The first part of the article appeared in the June issue, and already I have received some favourable letters from readers. I thank you for writing, and hope the second part will also be of interest to you. For those of you who often wondered what I looked like will now have some idea after viewing the front cover photograph of the same issue; I guess most of you will be disappointed!

The article has already brought forth a QSL from **John VK4ZJB** for our first QSO on 6 metres, which took place on 10-11-63 on 50 MHz (we were allowed to operate on that part of the band then), his transmitter was the famous SCR522 and receiver a 6BQ7 converter to a BC312. Thanks, John. I do wonder, though, what other memories the article may have stirred. Should any of you feel disposed to write after reading the second part then I would be pleased to hear from you.

A LITTLE BIT FROM VK4

Enclosed with the VK4ZJB QSL card was a short letter from John, which gives some interesting snippets of information regarding contacts on 6 metres over the past 12 months or so, interesting because they are so different from what we in the south work, and should be of interest to many despite the obvious long date line. I make no apologies for printing it!

20-11-79, made reluctant trip to QTH 30 km north of Brisbane, switched on and worked **H44PT** for first 6 metre VK4-H44 QSO. Then on 31-3-79 worked 5 overseas countries, three of which were his first to those areas. P29 and JA, then first to **HL9TG, KH6IAA** and **KG6DX.** John says the 6 metres was good enough into Guam for it to be relayed via 2 metre link north to Saipan, but no 6 metres there! Joe KG6DX apologises, John literally cries!

20-12-79 received a Christmas present from JARL for JCC/100 cities award for 52 MHz (not bad for a Channel 0 area). 6-1-79 **YJ8ZV** and **FK8AB.** 22-12-79, after waiting almost 20 years, landed two ZL4s on 52 MHz! They also worked VK4PU and VK4ZGI. 4-4-79 worked **W6XJ** for first mainland US contact. 9-10-79, whilst mobile worked **KH6NS** 5 x 9 both ways. 13-10-79 magnificent JA opening, worked all areas 0 to 9 twice in 6 hours.

25-11-79 listened on 50 MHz 0700 Qld. time. Band from 50.1 up was chock full of Ws, mostly 5 x 9. Heard both ends of **ZL1AVZ** to **VE1ASJ** contact on 50.110. (No Channel 0 programme at time.) A W4 was enticed to try 51.100 but nothing heard, MUF just not making it to 52 MHz. Heart-

break! VK4PU and VK4ZGI, etc., all going around the bend hearing this on 50 MHz! Whoever says 2 MHz is not important!

Judging by the fact there are no late dates mentioned by John it seems very little of real importance occurred during the autumn equinox even in the Brisbane area, so next spring will probably be our last hope for another 11 years or so!

SIX METRES — IT'S QUIET!

Because the VHF bands have been generally quiet after so much activity during 1979, especially quiet in the northern hemisphere it seems. It would therefore appear to be an appropriate time to let you read the lead article from Bill W3XO of "QST" and "The World Above 50 MHz". This article is written by **Jim Stewart WA4MVI**, who is the holder of WAS on 2 metres, and whose thoughts I am sure you will find interesting and thought provoking.

"World-wide DX on 6 metres again became a reality during the fall of 1979 as the long awaited sunspot maximum provided amateurs with rare ionospheric conditions not substantially present for 20 years. The 'old-timers' who were around during the last such glorious time, 1957-58, still remember those years as truly remarkable. Many comments are heard these days that 'Yes, 6 metres is good now, but you should have been on in 1957 . . .'.

"Those were good years for amateur radio and VHF activities. Talk filled the air of tracking the first space satellites, the International Geophysical Year (IGY) project, the first QSO via EME on 144 MHz. 6 metre DX and the relatively new technique of meteor DXing. A good 6 or 2 metre beam could be had for just over 10 bucks. As solar activity exceeded 200-year records, more and more amateurs discovered VHF DX. Contest scores soared, as did the ham population itself. Many achieved WAS and WAC on 6. Europe was worked from the western US for the first time, and the eastern US to Europe QSOs became familiar. The more skilled participants knew that if these DX conditions repeated themselves, it would probably be many years in the future.

"Ionospheric propagation via the F2 layer seldom takes place at 50 MHz except during very high solar maximums which occur about every 11 years. There is evidence now, however, indicating that some events show more correlation with a 22 year cycle and the best DX may very well re-occur with this interval. VHF band conditions were remarkably similar during 1957 and 1979, and less spectacular during 1947 and 1968.

"Modern studies of the sun began around 1610 AD when the invention of the telescope led to the discovery of sunspots. However, talk of these imperfections on the solar disc was quite unpopular in those days because of religious beliefs. Thus, we are uncertain of the accuracy of sunspot records until approximately 200 years ago, when the existence of 11 year cycles was observed. In recent times, interest in these cycles grew more intense when it was realised that the quality of radio transmission over long distances was related to solar activity. It soon became apparent also that DX conditions seemed to recur with the 27 day cycle, corresponding to the rotation of the sun. At some future time we may be able to say beyond any doubt that the best VHF DX conditions appear on alternate cycle peaks.

"The writer has observed the sun since the beginning of the present cycle by both optical and radio means. Careful analysis of daily records, along with WWV information, enable one to predict the recurrence of monthly events and gain some insight into the mysterious relationship between solar events and DX.

"It appears that our present cycle may have peaked on 10th November 1979. On this date WWV reported a 10.3 cm flux level of 383, and 144 MHz solar noise here at WA4MVI was the highest ever observed. Photographs made on this date show an extremely rare white light prominence associated with intense solar storm activity. Peak monthly 10.3 cm flux values for late 1979 were 232 for August, 233 for September, 242 for October, 383 for November and 247 for December.

"Careful study of band conditions during 1979 shows remarkably similar characteristics to those of 1957, and if the declining portion of the cycle is similar, we may be able to predict with some degree of certainty what may be in store on the bands in the months to come. During both 1957 and 1979, DX got under way by mid-October and peaked in November, with a slight decline in December. Both cycles saw early fall paths very good between the north-eastern US and Europe. As November arrived, the Europeans worked further west and JA contacts spread from the West Coast to the Midwest and parts of the East. The winter of 1958 saw openings shifting to more southerly paths between Africa and south-eastern US and from the western States to Australia and New Zealand. As winter turned to spring, north-south paths became more frequent. Summer days were somewhat quiet with little F2 or Es. During mid-October F2 again re-appeared much as in 1957, although not quite as frequently or widespread. North-south paths remained good for several years and auroral became intense, frequent and widespread.

"The spring of 1980 produced good north-south openings for the southern tier of States, along with some good opportunities toward ZL and VK. Again, the similarity with corresponding months in 1958 is striking. Very good tropospheric conditions could again appear during the summer and fall of 1980 as solar activity may indirectly cause weather patterns to move lazily across the country, allowing stagnant air masses and temperature inverted layers to form.

"The summer and fall of 1979 and 1957 saw remarkable tropo openings on 144 and 432 MHz. The tremendous opening last September will long be remembered. A new 'mode' of propagation on 144 MHz appeared during 1979 between Texas and Florida, with characteristics sounding much like aurora. A similar mode was described back in 1957! Sporadic E short skip was said to be off during 1957 and 1979. While it is still too early to characterise the 1980 Es season, we may be able to show in future years that this mode is poorer during years of high solar activity than in low sunspot years.

"These have indeed been unforgettable times for the VHF world, and they may not be equalled again for many years. If this writer's suspicions are correct, namely that the 22-year cycle is the key to the re-appearance of F2 sufficiently intense to cause widespread 50 MHz openings, then the fall and winter of 2001-2002 may be the time to watch!

"Special thanks to W4AIM and W4YIU for their assistance in obtaining past records of DX and solar activity. I hope that most of us will be around by the year 2000 to partake of whatever Old Sol has in store for us . . . Jim."

NEWS FROM BRAZIL

Gil VK3AUI passes along a letter from **Rolf PY1RO** dated 15-4 which, as elsewhere, indicates quite a dramatic falling off in six metre openings from that country. Es still exists from LU and ZD8, and TE only to 5B4 and ZB2. Rolf says the F2 is the big illusion and while the EUs work into ZS every day, there is no propagation from PY to either Eu or North America. But **PY2XB** had a 2 minute opening to **ZL1MQ** on 13-4 via Europe at 2155Z.

Dedication does pay off at times, as indicated when Rolf finally worked KG6 at 1 a.m. local time, after monitoring the band for something to happen for more than three hours. Opening lasted only five minutes and he worked **KG6JKS** and **KG6DX** within two minutes and heard nothing else. Maybe Rolf will hear more when he completes building that new 34 metre tower!

Gil VK3AUI gave me a list of the JAs he worked through February, March and April, additionally KH6EQI heard on 10-4, and KX6 heard weakly on 13-4 at 2345Z. **XE1GE** worked split frequency 0004Z on 14-4, at 0019Z Geoff peaked to S9 + 20 dB! On 20-4 **3D2DB** and **KH6EQI** both heard briefly, same time observed the KH6 to ZS contacts monitored on 28.885, but nothing heard in VK despite signals being beamed there. Thanks, Gil.

CAIRNS ON VHF

Ted VK4YG has written to say that on 7-6-80 the Cairns WICEN assisted the local SES with VHF communications using the Cairns Amateur Radio Club's repeater VK4RCA in a search operation for a missing bushwalker on Mt. Bartle Frere (5280 ft.), which is next door to their repeater on Mt. Bellenden Ker (5200 ft.). In spite of dense tropical rainforest, which is very

hard on VHF signals from low power handheld equipment, communication was achieved between Brian VK4AAU/P with the rescue group and mobiles VK4ACZ (Ron) and VK4YG (Ted) and WICEN control at VK4HM, the Club stations being operated by Mike VK4AMO, and several vital messages were handled. Good work.

Ted also mentions on 17th June from early afternoon until late evening local time **P29CC/P (Danny)** using a 4 element yagi was able to work through the Cairns repeater VK4RCA from Mt. Hagen in PNG — the site understood to be a microwave installation and altitude 11,200 a.s.l. Danny's signals held up to good strength right throughout the opening and he worked many fixed and mobile stations in the repeater service area. Distance about 690 nautical miles, so who has done better than that in VK4? Danny also stated a 2 metre repeater on Ch. 1 was proposed for the site, running about 20 watts.

Whilst talking about the Cairns repeater, Ted advises it will probably change from the present Ch. 7000 to 6950 some time in August, bandplan agreed, to overcome an interference problem with Mackay and Port Moresby on the same channel. The Cairns repeater has such good coverage it is deemed advisable to shift to some other channel.

NORTHAM NEWS

Tony VK6BV has been on annual leave, but sends a few jottings, mainly that ZL video on 45.250 was heard each day up to 8-5 from 0000Z for about five hours, then nothing heard since then. JAs on 3-5 and 4-5.

Included were a few points from Wayne VK6WD. **5Z4YV** ex JA2KTL operating from 1-5 on 6 metres using IC551 to 5 element yagi. **I5TDJ Pete** has permission to operate **50.000 to 50.500** for six months from May. **SV1DH** has permission to operate on **50.150** with the call sign of **SZ2DH.** The **GB3SIX** beacon on the island of Angelsea on **50.020** is now operational with 20 watts to a 3 element yagi beaming west, on air hours are **0000 to 0730Z** daily. Thanks for the continuing news, Tony.

GREEK TE PROPAGATION STUDIES

Steve VK5AIM sends a copy of an article in "The Short Wave Magazine" which should be of interest to those who study propagation and I quote:

"Your scribe had a long talk with **Charlie Newton G2FKZ,** recently returned from a trip to Greece, where he met **Costas Fimerellis SV1DH,** one of the keen researchers into 'Transequatorial Propagation at VHF/UHF'. Charlie was manning the RSGB Propagation Studies stand and played a fascinating recording of the pulsed 28 and 144 MHz signals from Africa as received in Athens. SV1DH now has Greek Government backing for this investigation into what part of the ionosphere carries VHF signals over such long distances and is making this TEP study the basis of his Doctorate degree.

"Obviously, extreme accuracy is vital if any firm conclusions are to be made. To this end the 2 metre and 10 metre beacons ZE5JV at Salisbury are keyed simultaneously in phase with the atomic time standard in Pretoria. The time delays of the arrival of the signals in Athens are 30-plus milliseconds, this interval being measured by reference to the atomic time standard of the Mediterranean LORAN chain.

"The multi-path, Doppler-spread signals sound semi-auroral and a definite time pattern has been observed. It is possible to follow the paths of the heavily ionised blobs as they track across the Indian Ocean, the African continent and finally over the Atlantic Ocean. Indeed, so predictable was this progression when Charlie was with Costas, that SV1DH showed Nigerian TV on 62 MHz received on a domestic set with whip aerial at just the right time."

So there you have it. Isn't it nice to see a government backing an amateur with his studies into propagation, if this brings forth information showing predictable trends in VHF propagation it will be a great step forward.

GIBRALTAR TO JAPAN

Further to my brief mention last month it now seems quite definite that on 10-4-80 between 0010 and 0025 **ZB2BL** completed 6 metre contacts with JA1BK, JA1TGS, JA1PVI and JA2GHT. Signals ranged from 579 down to 439 as the end of the opening approached. Antennae at both ends were aimed long path or over the pole. Again, so much for having 50 MHz! Thanks to Bill W3XO.

NATIONAL VHF FIELD WEEKEND

The Geelong Amateur Radio Club has decided to sponsor a field weekend to encourage summer-time portable VHF operation. The weekend has been tentatively arranged to coincide with the start of the Ross Hull, using the scoring and rules of that contest. A log of the best 12 hour segment of the first 48 hours of the Ross Hull Contest will count for individual State winners. Each portable station submitting a log will receive a card. Further details next month.

It is hoped this Contest will receive some good support, the last time such an effort was arranged was in VK5 some years ago, but at the time all anyone could think about at the time was repeaters, so after a few years it fell flat. Today, however, I believe people generally have rationalised their thinking in regard to repeaters and have encompassed it as part of their general operating, where it serves a good purpose. With so much equipment now in shacks operating on 12 volts it is likely more gear would be available for portable operation.

From the shack of VK5LP I would like to make a suggestion which might help to get more participation in this or any other Field Day type operation. Normally such operation assumes equipment will be powered from batteries or an alternator. Unless you own your alternator, they are not very readily available, and as they are generally hired out on a so-much-a-day basis, if you have to pick one up on Friday, use it Saturday and Sunday, return it Monday, you will probably be charged for four days, and this can be expensive, apart from the inconvenience of perhaps having to travel 20 or more miles to get and return the thing! Personally, I cannot see anything wrong with an operator also being allowed to take his own equipment away from his property to either a remote location, or at least some location not being the shack of another operator, and connecting to the 240 volt mains if available. It seems to me there are such sites where two-way radio installations operate from hilltops, beacon sites, country dairies, pumping stations, etc., all provide a means for some operators to go out and work a field day operation. By suggesting away from another shack this ensures that someone just does not pick up his gear, travel to his mate's place, plug it in and use his antennae. The portable operator would at least have to do something about an aerial installation, the fact that he may have the assistance of mains operation is not so important when one considers the very wide distribution of power these days. Give it some thought, boys, it won't suit the purists I know, but it may get more to go out and thus ensure the success of the field day!

OSCAR PHASE 3

It was certainly an unfortunate demise for the Oscar Phase 3 satellite launched from French Guiana on 23-5-80. The rocket went out of control after the first stage had trouble with one of its four rockets not igniting, and the whole thing had to be destroyed. Over $100,000 in AMSAT finance was lost, and it may be up to three years before a replacement can be built. I assume therefore that any donations to further the project would be gratefully received.

TWO METRES

The 2 metre band hasn't been entirely dead, not for **David VK5CK** from his prime location at Piccadilly in the Adelaide hills. He's the voice "on" the hill, I'm "in" the hills! David started out real early on 2-6 at 0608Z and worked VK3QG and then continued a long stint on the band, ending at 1539Z with VK3BNU at 5 x 9, so the band was still open! In between he worked VK3ZL, VK3ZHP, VK3ADR, VK3YUZ, VK3BEH, VK5ZCP (Penola), VK3XQ, VK3ZBJ, VK3BHS, VK3YNB, VK3ZIW, VK3BWC, VK3YRY, VK3NM, VK3DKC, VK3BAR, VK3ZY, VK2DAB (Griffith), and VK3UV. Most of the signals were 5 x 9, but very few were audible at VK5LP, those that were were very weak. On 5-6 David worked VK3YL, VK3ZHP, VK3ZL and VK3BNU from 1113Z. He had another ball on 22-6, starting even earlier with VK3UM at 0400Z 5 x 6, closing at 1237Z with

VK2BXD in Griffith. In between contacts were to VK3ADR, VK3YNB, VK3ZBJ, VK2YEZ (Griffith), VK3BHS, VK3AXV, VK3AFW, VK3BEH, VK3BKF and VK3BNU. The Orange Ch. 8 repeater is heard from time to time just for good measure!

The above effort means David has had contacts with 28 different stations in three stints of operating, but generally the signals from interstate do not reach the Adelaide area at any strength. When they do Col VK5RO works them! David keeps skeds each week with Les VK3ZBJ on Mondays and Thursdays at 1300Z on 144.040, and despite the 400 mile path has been having considerable success in making contacts.

SERG CONVENTION

The South-East Radio Group Convention held over the Queen's holiday weekend in June at Mt. Gambier attracted a large attendance of amateurs, mainly from VK3 and VK5. The weather turned sour to provide one of the wettest conventions in its 14 year history, but this did not dampen the spirits of the gathering, and all contests and competitions were held with some cars becoming bogged. Winner of the SERG trophy for the contest, gaining the most points throughout the convention, was Bevan VK5TV, who enters everything possible and was a well deserved win.

The SERG are to be complimented on the continuing success of their convention, and the large measure of support from both States should ensure its success in the years to come.

CLOSURE

I hope that next month I might be able to find enough time to include some information on the proposed "Locator Squares" system of locality identification for this country. The locator is widely used overseas, particularly in Europe, and contests are even conducted trying to work as many squares as possible.

In the meantime, I close with the thought for the month: **"Don't be afraid to take a big step if one is indicated. You can't cross a chasm in two small jumps."**

73. The Voice in the Hills. ■

AMATEUR SATELLITES

R. C. Arnold VK3ZBB

PHASE III

Phase IIIA satellite is now just history and unfortunately lying at the bottom of the ocean. It is obviously a great disappointment to AMSAT and the many satellite operators around the world, particularly as its demise was no fault of the dedicated band of constructors and volunteers who prepared the satellite for launch.

The following joint ESA-CNES press release describes the sequence of events following the launch:—

Ho + 3.3 sec:
Launcher lift-off.

Ho + 4.4 sec:
All four engines function nominally up to this instant.

Ho + 4.4 sec to Ho + 6 sec:
Chamber pressure of engine "D" begins to fluctuate by ± 4 bar, finally oscillating at an amplitude of ± 11 bar at a frequency above 1000 Hz; on the films, this anomaly shows up as a yellow colouring. The mean chamber pressure remains nominal.

Ho +6 sec to Ho + 28.3 sec:
Engine "D" is once again nominal.

Ho + 28.3 sec to Ho + 28.45 sec:
Recurrence of chamber-pressure oscillation of ± 7 bar on engine "D", showing up in the same way on the films.

Ho + 28.45 sec to Ho + 63.8 sec:
Pressure of engine "D" once more nominal. A temperature sensor on the propulsion bay records a linear rise from + 24° to 56°C.

Ho + 63.8 sec:
The temperature in question rises sharply to 100°C, and the chamber pressure of engine "D" falls simultaneously to 10 bar. The vehicle experiences a powerful roll torque.

Ho + 63.8 sec to Ho + 104 sec:
The flight-control system succeeds in maintaining the launcher in the nominal trajectory plane. The roll rate reaches 60° per sec.

Ho + 104 sec:
Fall in chamber pressures of engines "A" and "B", hitherto completely nominal. Engine "C" continues to function nominally.

Ho + 108 sec:
Fall in chamber pressure of engine "C" and destruction of launcher, probably initiated by the breaking of a structural connection, as a result of considerable general stresses. Consequently, the self-destruct system fitted to each tank operates. Tank pressures have been nominal up to this point.

A study in depth of the various recordings and films available will be necessary in order to determine the initial cause of this apparent malfunction o fengine "D".

This is only the second major disappointment for the satellite fraternity — actually two failures out of nine — but we should not let it affect our future aspirations. THE PHASE III PROJECT MUST NOT DIE; satellite communication is still a great and interesting challenge for amateur radio to relieve the congestion on the HF bands and to provide educational and emergency facilities.

Phase IIIA was not insured and its loss to AMSAT is probably 20 per cent of the total expenditure of $150,000, plus the dedicated labour effort of about 30 man months.

IIIB can be a goer as soon as a launch vehicle is found — hopefully within two years — and therefore your continuing support for AMSAT is essential — let them know you are still interested — recruit new members (particularly life members) and give your financial support, either directly or through your local radio club.

SATELLITE OPERATIONS

Both AO7 and 8 are performing well. For the past few months AO7 has been permanently in Mode B. Due to its travel in shadow when coming up from the south, we do not obtain acquisition for the first ten minutes after the satellie crosses the horizon (this applies to the south of the continent) and therefore the time of operation is limited. However, contacts have been continued with YB, 9M and JR6, but VK0 seems to have been wiped out due to the shadow problem. AO7, hopefully, should be back to normal in August if our theoretical calculations are correct in practice.

PREDICTIONS — AUGUST

	OSCAR 7			OSCAR 8		
Date	Orb. No.	Eqx Z	Eqx °W	Orb. No.	Eqx Z	Eqx °W
3	26150	0101	87	12295	0057	67
10	26238	0136	96	12393	0131	76
17	26325	0016	76	12490	0021	59
24	26413	0051	85	12588	0055	67
31	26501	0126	94	12686	0129	76

The above figures are computed from the following basic data:—

AO7

Period (Min/orbit) = 114.9521618 — (3.811 × 10^{-7} × orbit number).
Angle Increment (deg./orbit) = 28.7374.

AO8

Period (Min/orbit) = 103.2407098 — (3.1017 × 10^{-6} × orbit number).
Angle Increment (deg./orbit) = 25.810364 — (6.502 × 10^{-7} × orbit number).

AMSAT NEWS

Dr. Perry Klein W3PK, the founder of AMSAT, has resigned from his positions as President and General Manager as from 1st July, but will retain his interest as a consultant. Perry has guided the fortunes of AMSAT for the past eleven years and has brought recognition and credit to the Amateur Radio movement. Thanks, Perry, for a job well done.

Dr. Tom Clark W3IWI assumes the office of Acting President and, with "Rip" Riportella WAZLQQ as Acting Executive Vice-President, will serve until the Annual Meeting on 13th September.

The AMSAT office has been relocated, with Martha Saragovitz remaining as Office Manager. The mailing address is unchanged at PO Box 27, Washington, DC 20044, USA. Phone No. is 301-459-9230.

A meeting will be held at the University of Surrey, UK (builders of UOSAT), September 19th-22nd, to discuss the formation of AMSAT-International. Federal Executive has approved my attendance as a representative of WIA, and I look forward to this opportuntty to participate in discussions which may lead to a closer liaison between the many countries having AMSAT affiliations.

LOCAL NEWS

Andy Squires VK3YQX has agreed to act as satellite co-ordinator for VK3 and will be supplying a regular feature for the Divisional broarcast.

Other Divisonal correspondents are Alan VK2RX, Peter VK4PJ, Colin VK5HI, Peter VK7PF. Do we have an interested amateur in VK6?

The Brisbane VHF Group and Redcliffe Radio Club will become members of AMSAT.

With the demise of Phase IIIA, the local net will be reduced for the time being to the third Sunday in each month at 1000 GMT on 7065 kHz with VK3ACR as control station.

Paul VK3BWC has started a recruiting drive for satellite operators in the Ballarat district — thanks, Paul.

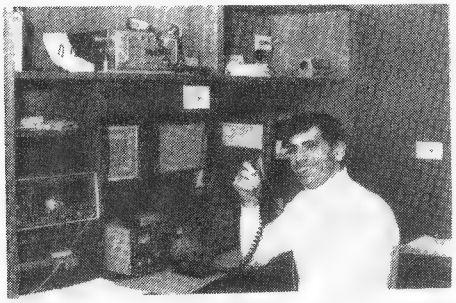
ACKNOWLEDGEMENTS

AMSAT, Mode J Club, VK4PJ, VK3ACR.

■

SPOTLIGHT ON SWLing

Robin Harwood VK7RH
5 Helen St., Launceston, Tasmania 7250



Those pursuing SWL DXing will find no matter what receiving equipment is used, whether it be a two transistor regenerative detector or a sophisticated solid state PLL receiver with digital readout, that the performance depends on the antenna used. It should be clear of any protruding wires such as electrical or telephone cables and the height of the antenna can be 5 metres or more above ground. Another consideration is the polarization of the antenna. Vertical polarized antennas are more prone to electrical noise than a conventional horizontal dipole, and therefore are not recommended for built up areas. However verticals will work fairly well, especially where space limitations rule out the installation of a horizontally polarized dipole. A good ground connection is important in reception, particularly with vertical ground plane antennas. For further help with the construction of the antenna, it is recommended that the SWL consults a good handbook on aerial systems such as the ARRL Handbook. For general coverage listening, I recommend that the antenna length be between 10 and 30 metres, and by experimentation you should obtain optimum results.

With the use of a coupler or transmatch between the receiver and antenna, you can match the set to the correct impedance of the line. This can also improve reception. Most handbooks on antennas do have simple circuits of coupling units or transmatches.

It will soon be realised that there will be a need for accurate calibration of your receiver, so as you can find any given frequency easily. I have included a table of standard frequency stations to assist in this. Also by using a 1 MHz crystal together with some ICs, it is feasible to construct a crystal calibrator with beats of 1, 10, 100 and 1000 kHz.

STANDARD FREQUENCY TRANSMISSIONS

2500 kHz WWVH Hawaii.
4500 kHz VNG Lyndhurst, Vic.
5000 kHz WWV, WWVH.
8000 kHz JJY Tokyo.

An aid I find useful, and indeed indispensable, is a publication entitled the World Radio TV Handbook, edited by Jens Frost of Denmark. This annual publication contains a listing of most international, national, regional and local rdio and television stations. There are two forms of listing — alphabetically by nations, and numerically by frequency allocations. It also provides the addresses and locations of the broadcasters, as well as reviewing late model receivers. It is obtainable from most technical book stores.

It is also helpful to be with other SWL enthusiasts to exchange ideas and loggings. Contact your local Divisional Secretary and ascertain if there are active SWL groups in your area. Also the Southern Cross DX Club, PO Box 336, Adelaide, SA 5001, publishes an excellent monthly bulletin of loggings and tips for the SWL DXer. This club is affiliated to the WIA through the VK5 Division.

Several international broadcasters have specific programmes designed for the SWL DXer. These programmes bring the listener up to date with developments within electronics as well as current loggings from monitors throughout the world. In Table 2 there is a list of current programmes for DXers heard here in Australia.

CURRENT DX PROGRAMME

Ecuador HCJB — DX Partyline at 0900Z, Monday, Thursday and Saturday. Frequency 6130, 9745, 11900 kHz.

UK BBC — World Radio Club. Sunday at 0745Z, repeated 1115Z Monday and 2315 Wednesday.

Netherlands — DX Jukebox, Thursdays at 0750Z and also 0850Z in English Programme.

NZ — Radio New Zealand on every second Monday at 0845Z 6105 kHz.

Well that is all for this month. I would welcome your comments and suggested ideas for this column via the above address. Next month we will be looking at reception reports. ■

AMATEUR RADIO ACTION

is the NEW GENERATION amateur magazine.

★ Comprehensive DX notes
★ Propagation forecasts
★ Very technical - and not so Technical articles
★ Useful projects

Here are just a few of the articles which have appeared in recent months

★ Fixed wire beams
★ Case for UHF beacons
★ 80W linear for 6m
★ Wilson System Three review
★ Spratly DX exclusive
★ Backyarders - good or bad?
★ A.T.V. Special
★ SWL notes

Average page content is 80 pages - at $1.20 an issue that's good value.

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Inflation still spirals prices upwards, as we have advised often. If you are thinking of buying new equipment, now is the time to buy — the next shipment is almost sure to be dearer. Even when purchases overseas are favourable, increased freigh and handling costs cause increases. We still continue to sell at as low a price as we are able but as an example the next shipment of goods from the USA will increase by 18%

ROY LOPEZ

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A Famous Brand

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2-KD5-2KW PEP 80-10M SSB/CW/RTTY/AM **$1000**
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ANTENNAS

TET HB-35C 10-15-20M log/yagi HY-GAIN **$415**
8 el 2M yagi 14' boom 15db gain **$50**
14 el 2M yagi 28' boom 18db gain **$60**
TH3-JR 10-15-20M 3 el yagi **$250**
DB10-15A 10-15M 3 el yagi **$190**
153-BA 15M 3 el yagi **$120**
18AVT/WBa 10-80M vertical **$110**
GPG-2 2M 5/8W collinear 3-4db gain **$25**

HELICAL Mobile whips 10-15-20-40-80M heavy duty de-luxe model w/adj. tip ..... **each $25**
GPV-5 2M Base. Collinear 2 x 5/8W **$55**
OSCAR 2D 2M mobile. Collinear 2 x 5/8W **$35**

BN-86 balun for beam buyers 'only' **$25**
HI-Q baluns 50 ohm 1 KW 1:1 ..... **$15**

ROTATORS AND CABLES

All rotators now come with bottom brackets and control indicator boxes wired for 28V AC —

CDE BT1A BIG TALK light duty programmable 4-pos. push button plus normal operation **$85**
KEN KR-400 medium duty **$140**
KEN KR-500 vertical rotator **$170**
CDE Ham 1V heavy duty "Aug. delivery" **$225**
CDE T2X Tail twister extra HD "Aug. delivery" **$300**
RG-8U foam co-ax. per meter now **$1.20**
8-cond. rotator cable. per meter **80c**

ACCESSORIES

SWR meter Hansen twin meter 150MHz **$35**
SWR meter Single meter 150MHz **$25**

ASAHI chrome bumper mount **$8**
Standard bumper mount **$5**
Chrome base and spring to suit ASAHI mount **$15**
FERGUSON 240V AC transformer 2 x 9V secondaries at 3A **$8**
DYNASCAN 820 digital capacitance meter **$150**
TRIO DM-800 grid dip meter **$120**

TRIO KENWOOD PRODUCTS

TS-520SE 10-160M 240V AC transceiver ..... **POA**
TS-180S 10-160M 12V solid state ..... **POA**
TS-120S 10-80M 12V solid state ..... **POA**
TS-700SP 2M all mode trans. ..... **SPOA**
R-1000 digital clock receiver ..... **POA**
TV-502 2M transverter for TS-520/TS-820 ..... **$250**
SP-100 for R-1000 ..... **$32**
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SO-239 - 4 hole and single hole types **75c**
MLS right angle RG-58U to PL-259 ..... **75c**
In-line mic. sockets 3 & 4 pin ea. **60c**
Mic. sockets 3 & 4 pin each **75c**
M-ring body mount w/lock nut **$1.50**

NOVICE SPECIALS — CONVERSION CRYSTALS

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Set of 4 crystals converts 28.310-28.600 MHz. 10 and 20 KHz steps. Clarifier tuning Tx and Rx ..... **per set $15**

All prices are NET, ex Springwood NSW, on pre-payment with order basis. All risk insurance is free of charge, allow for freight charges by air, road, rail or postal, excess will be refunded. Prices are subject to change without prior notice. All orders cleared on a 24-hour basis after receipt of order with payment.

ROY LOPEZ (VK2-BRL) Manager

FORWARD BIAS

JOTA 1980

It's on again — Jamboree on the Air takes place over the 18th October weekend, when Scouts and Guides will again be at the Scout Hall in Hughes (and we hope at another base station on the north side) to take part in QSOs with other Scouts and Guides, wherever they may be.

The programme has not been finally drawn up; how ambitious it is, will depend on the help of VK1 members. At the moment Gus Napier VK1NBO is busily persuading, inveigling and co-opting willing VK1s! This year we hope to expand the Jamboree activities and give the boys and girls opportunities to see and experience more aspects of AR than in the past.

VK1BP will broadcast the official opening ceremony from Government House on the Saturday afternoon.

VK1HS will be activated and will operate, if there are enough amateurs available on roster, from midnight Friday until midnight Sunday at the Hughes Scout Hall, Kitchener Street (on the border between Hughes and Garran, ACT). It's expected there will be some Scouts camping near the hall.

Late on Saturday afternoon, VK1BP will move to the Hughes site from Government House and will operate for the remainder of the weekend.

If there are enough amateurs available on the Sunday morning, we'd like to conduct a VHF fox-hunt for the boys and girls, starting from the Scout Hall and, if possible, we'd like to set up representative displays of amateur radio equipment (old and new).

As in the past, we'd like some willing amateurs to take small groups of Scouts and Guides to their QTHs and let them see what model ham shacks look like!!

On the Sunday afternoon, if sufficient interest is shown in other Divisions, it is proposed to have a National link-up with as many stations as possible participating in JOTA giving brief reports of their activities over the weekend. Here, and subject to P. and T. approval, the idea is for these reports to follow a standard message format. In the ACT, the WICEN organization has agreed in principle with the proposal — which would be along the lines of a WICEN exercise but **not** an exercise as such. It would be a JOTA communications net.

So there it is. These are our preliminary ideas. We are looking for help and any assistance and ideas you can offer will be greatly appreciated. Gus Napier 1NBO can be contacted on (062) 65 3555 during the day or at his QTH on (062) 82 1457 at other times. He can be reached of course on PO Box 46, Canberra. If you are planning to visit Canberra that weekend, we'll be most glad to see you at the Hughes Scout Hall.

DX CENTURY CLUB

Our Secretary, Fred Robertson Mudie VK1NAV, is now the proud possessor of the WIA DX Century Club Certificate. Fred, we believe, is the first Novice call in VK1 to gain this award. Congratulations and FB, Fred. ■

QRK5

A monthly transmission from the Victorian Division WIA.

Written and co-ordinated by VK3WW, QTHR.

WILLY WILLY'S WORDS

What a great idea to print Divisional news and views in AR. I hope these will become a regular line of communication with members and also let other Divisions know what we are doing; of course we will be able to read what other Divisions are doing, so the whole deal will promote an exchange of ideas.

THE NEW COUNCIL

President: A. Noble VK3BBM
Secretary: G. Atkinson VK3YFA
Treasurer: P. Drury VK3JN
Members: M. N. O'Burtill VK3WW, G. Williams VK3ZXW, A. Heath VK3KZ, J. Adcock VK3ACA, K. Scott VK3SS.

Please note that Councillors all carry one or more special posts and these will be mentioned in profiles to be published in following issues.

A MAJOR AIM

Have you ever wondered why people whose hobby is built around radio communication do not communcate too well??

If you know the answer please tell me.

Council have decided to make a major effort to improve communication between members and Council — these notes are one way. The weekly broadcast is another way but neither will work if you, the member, wont read or listen.

Will Zone and Club Secretaries please help by ensuring that the broadcast is monitored in your area and that the Federal and Divisional news is passed to all your members as quickly as possible?

Council minutes will be sent to Zone and Club Secretaries as soon as possible after each meeting and members should be made aware of Council resolutions during Zone and Club meetings.

It is of course desirable that members seek information on matters of interest from — the broadcast — Zone and Club Secretaries and WIA Councillors.

Contributions to these notes will be welcomed from any members. Please try and submit items of general interest to all members and if at all possible DOUBLE SPACED TYPED COPY. Remember a lead time of about six weeks is required to make any particular issue of AR.

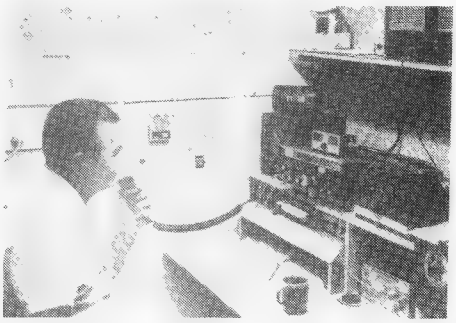
QUESTION TIME

If a person who is not a member of an organization is allowed to use one or more of the facilities of that organization, is there any reason why members should continue to pay fees for the same privileges??

MEET YOUR COUNCILLORS

This month — **your scribe VK3WW.**

Licensed in 1958 as VK4OM, Mike subsequently made an economic migration to VK3, where he has continued to follow his favourite aspects of AR — DX rag chewing, building test equipment, experimenting with antennas, shooting sacred cows, RD contesting (bring back the open section) and degassing the odd 807. New to Council this year, he has for the past three years been Victorian Division Librarian and has, with much help, established a reference library of texts and magazines, including every issue of AR since its inception.



A firm believer in service for members, he would like to see the WIA adopt a constitution suitable for the 1980s and concentrate on the needs of members. He has held WIA membership for 21 years.

LUNCHEON MEETINGS

Amateurs and SWLs visiting Melbourne from anywhere are welcome each Thursday at noon lunch with a friendly group of amateurs at the Moonee Valley Hotel, 376 Brunswick Street, Fitzroy (one block south of the WIA Centre). Interstate visitors please note the hotels is in FITZROY, as its name is also a Melbourne suburb.

QUESTION TIME AGAIN

Are lovers of the lash excited by a helical whip??

SUPPORT THE RD CONTEST

This month it is on again and I hope we see a lot of new activity. I am completely biased when I say this because I always enjoy the RD. VK3 can win it if everyone puts in a little bit of time and then sends in their log.

That's the lot for this month, if you have any comments or criticism please let me know — if I hear nothing I must assume it is QRK5.

73. Mike. ■

HELP WITH INTRUDER WATCHING

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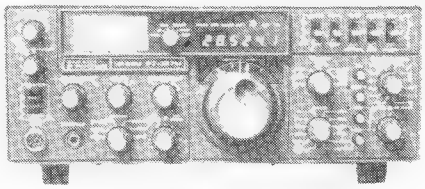

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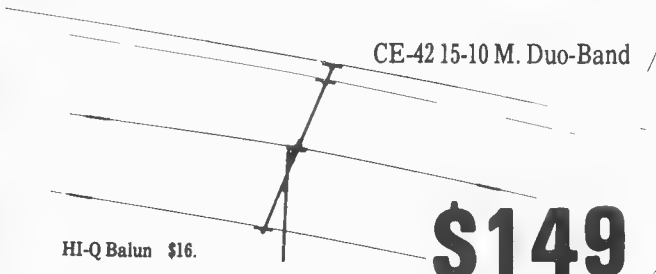
DR7500X Medium duty "X"	$169.
DR7600R Heavy duty "R"	$269.
DR7600X Heavy duty "X"	$249.

Chirnside Vertical Antenna Type CE-5B Features.
Long length and high Q traps makes the CE-5B more efficient then similar types of antennas especially on 80 Metres.
It is also very easy to tune and its construction is very rugged.

Specifications of the CE5B.
Bands: 80-40-20-15-10 M. Operation.
Power handling: 2 kW PEP.
SWR: 1.5 to 1 or better.
Length: 30' (approx)
Weight: 9KG. Packed.

$99.--



CE-42 15-10 M. Duo-Band

HI-Q Balun $16.

$149

CHIRNSIDE CE-42 rugged duo band beam features 4 elements and uses independent reflectors for optimum results.
3 elements on 15 M.
3 elements on 10 M.
Director and driven elements have hi-q traps.
Forward gain is 8 dB and front to back ratio is in excess 25 dB

CE/33 20/15/10m Triband Yagi 14' Boom **$249**
CE/35 20/15/10m Triband Yagi 19' Boom **$289**

Please Note !!!
These are recommended retail prices only.
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FT-707. All solid state HF transceiver. incl. 10, 18, 24 MHz.	
FV-707. Digital VFO for FT-707 incl. scanning.	
FC-707. Antenna coupler for FT-707.	
FP-707. DC power supply for FT-707 with inbuilt speaker.	
Rack mount for all the above items also available.	
FT-107M. HF transceiver excluding power supply.	
FT-107DMS. HF transceiver incl. DMS and power supply.	
FC-107. Antenna coupler for FT-107.	
FV-107. External VFO for FT-107 series.	
SP-107. External speaker.	
FT-107 Range is available in the colours grey or ivory.	
FT-720 New FM Transceiver.	
YM-35 Scanning hand mic.	
NC-2 Base Charger for 207A	
FV-101Z Ext. VFO for FT-101Z series	
FT-720 2M FM Transceiver Inc. Scanner	
FL-2100Z Linear for FT 101Z range.	
FT-101Z. 160-10M Transceiver. analog dial.	
FT-101ZD. 160-10M Transceiver. Digital.	
optional digital display for FT-101Z.	
optional Fan.	
optional DC-DC converter.	
YE-7A Hand mike.	
YD-148 Desk mike	
FT-901DM. 160-10M Transceiver.	
FV-901. ext.VFO for FT-901 & FT-101Z.	
YO-901. Panoramic adapter monitorscope.	
FC-901. Antenna coupler.	
FTV-901. Converter. 6M,2M,70 cm. all inc.	
FTV-901. Converter. 6M,2M. only	
SP-901. ext. speaker.	
FRG-7. Communication receiver.	
FRG-7000. Digital communications receiver	
LF-2A Narrow band filter for FRG-7.	
FT-7B. 80-10M Transceiver.	
FP-12. 12 Amp. power supply for FT-7B.	
YC-7B. Digital display for FT-7B.	
FT-227RB. 2M Digital programable transceiver.	
YP-150. Dummy load/Watt meter.	
FF-50DX. Low pass filter. 2kw.	
QTR-24D Deluxe 24 hr. World clock	
FT-207R Handheld.	
NC-2 Base Charger for 207A	
CHIRNSIDE CE-33 Triband Beam	

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0.77	0.85	1.00	1.30	10+

WIDE RANGE	C60	C90	
(For dynamic	1.45	1.95	1.9
range and less tape noise)	1.40	1.90	10+

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VK3	2.00	3.00	**C.O.D.**
VK1, 2, 7, 5	2.50	4.00	**ADD**
VK4, 6	2.50	5.00	**$2.70**

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6 EL 6m	**$102.00**

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3 EL 10m, 3 EL 15m **$135.00** ea.

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Our beams are easy to assemble and adjust. Entirely **NEW** CONCEPT — **NO** NUTS OR BOLTS.

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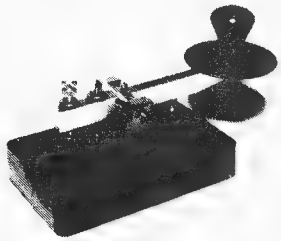

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DIVISIONAL NOTES

VK3

ANNUAL WESTERN ZONE CONVENTION
LOCATION
"Kangaroobie Convention Centre", Princetown (in the foothills of the Otways).

SATURDAY
- Registrations.
- Dinner (BYO licence).
- Famous Digger Entertainment.

SUNDAY
- Trade Displays.
- Trading Table.
- Competitions for XYLs and Harmonics.
- Competitions for OMs — 40/10m scramble, 2m FM and SSB scramble, 2m sniffer hunts, 80/10m scramble Tx hunts, 2m FM/SSB hidden Tx hunt.

Accommodation, meals available at site. Also motel accommodation available.

Talk in facilities on HF and VHF.

Registration forms, route directory and programme — send stamped, self-addressed envelope to K. J. Reid, 166 Turrong Road, Cooriemugle, via Timboon 3268.

Entries close 11th October, 1980. ■

VK4

Readers' attention is drawn to two 80m nets in Queensland, both originated by the VK4 Divisional Council in response to relevant motions, presented and accepted at the Queensland Radio Club Workshop, April 1978.

The first net is held every **Tuesday** from **0930 UTC** on approximately 3.605 MHz with **VK4AWI** as net control. This net is known as the **Queensland Radio Club Net** and is intended as a communication channel between Council and representatives of affiliated radio clubs in VK4. A number of these Club stations are using the VK4W . . call and are not pirates (!).

The second net is held every **Thursday** from **0930 UTC** on approximately **3.605 MHz** with either **VK4QA** or **VK4NLX** as net control. This net is known as the **Queensland Net** with as its main purpose a communication link between WIAQ members and non-members and Council. Certain questions raised are often answered on the spot, while others will be answered by mail.

This particular net is also used as a "meeting ground" by those interested in the VK4 Award, Worked All Cities, Towns and Shires. Lately a renewed interest is also shown for the ACE Award and VK4 net participants are now also announcing, besides their QTH, the Commonwealth electorate. Amateurs from other Divisions are invited to check-in on this particular Queensland net.

The frequency of 3.605 MHz was chosen to ensure that all equipment is known to work well around the 80m WICEN net frequency in case something unforeseen should happen.

Finally, a request to 80m users . . . the net frequencies, when in use on either Tuesday or Thursday, are NOT meant as tune-up frequencies. You are better off to go down a few kHz and tune on THAT broadcast station on 3.6 MHz.

For VK4 Award information readers are invited to send an SASE to the WIA Queensland Division, GPO Box 638, Brisbane 4001. ■

INTERNATIONAL NEWS

RECIPROCAL LICENSING

A few years ago it did appear that reciprocity of amateur licensing showed signs of encouraging improvement. Latest news may prove this view to be over-optimistic.

The Institute won a battle in 1972 by having reciprocal licensing in Australia split into two. One dealt with visitors and the other with intending residents. Prior to that time any amateur coming to Australia could obtain a VK licence only if a formal reciprocal agreement was in existence between his country and Australia or if he passed the VK exam. Reciprocity existed with only eight countries and this still applies to this day, although some negotiations are currently taking place with a ninth country — Japan.

To some extent the existence of a formal reciprocal agreement is not of much importance if each country grants reciprocal licences to visitors — "guest" licences as they are termed. Unfortunately not too many countries grant "guest" licences but the numbers are growing. And this may snowball, particularly when it can be pointed out that Australia has issued "guest" licences since 1972.

Any licensed amateur, irrespective of country, can obtain a VK licence if he comes to Australia on a bona fide visit not exceeding 12 months and produces the proper documentation in support of his application. For further details on reciprocal licensing see AR January 1978, page 25 onwards. QST for May 1980 lists a number of amendments to the Canadian Radio Regulations, some of which refer to reciprocal licensing.

USA amateurs may operate in Canada without prior registration, but they may only use the frequencies, types of emission and modes authorised to their licence in the USA **and** with the proviso that all these are authorised for use in Canada by the Canadian Regulations. The same principle applies for other foreigners but with the additional proviso that there must exist a reciprocal agreement between Canada and the foreign country concerned and application must be made. There is a formal agreement between Australia and Canada but only in respect of full privilege licences (see AR August 1972, page 17).

The preceding paragraph means that if you, as an Australian full call licensee, obtain a licence for Canada you could in Canada operate on the

160 metre band only between 1800 and 1860 kHz (as authorised in Australia) even though Canadians themselves can operate between 1800 and 2000 kHz subject to location, power and mode restrictions. These Canadian location, power and mode restrictions would also apply to you. Much the same would happen on 6 metres. You could only operate between 52-54 MHz, although the Canadians themselves can use 50-54 MHz.

For any other country, on the other hand, you as an Australian in possession of that country's licence, would be subject to the rules and regulations applicable to amateurs in that country, regardless of what you are permitted at home. For example, if you obtained a "G" licence under the reciprocal agreement, you could, in G-land, make use of their 70 MHz band but you could not operate on 6 metres because G-stations have no band on 6 metres. This is what applies in Australia to any overseas amateur visiting and licensed for Australia. He must comply with our Regulations, which means, for example, that a "W" visiting Australia and licensed in Australia could only operate on 40 metres between 7.0 and 7-15 MHz even though at home he could operate between 7.0 and 7.3 MHz (and he would not be allowed third party privileges, 1 kW power, etc., as he has at home).

Another thing. What call sign would be used? For the visitor to Australia he would have to use the call sign allocated to him on his Australian licence. For the Australian obtaining a licence to operate in another country the rules vary. In some countries you are allocated a call sign in the call sign series of the country (e.g. in G you would be given a G call) but for other countries you could use your home call sign followed by the country suffix (e.g. VK1BZZ/W6). In international waters, if you operate from a vessel, you would use your own call sign (with the suffix such as "Maritime Mobile" or MM).

Now for some pitfalls, especially for anyone too "clever" for his own good. And it is these people who can make licensing administration tighten up on their reciprocity conditions. The USA has reciprocal licensing agreements with some 50 different countries and the UK with 20-odd countries apart from Commonwealth countries. Let us say you, as a licensed Australian full call amateur, would want a visitor's amateur licence in Italy. Your Australian licence would be no good because there is no reciprocal agreement between Australia and Italy. Getting a W licence for yourself specially for this purpose would also be no good because there is no reciprocal agreement between the USA and Italy. However, there is a reciprocal agreement between the UK and Italy, but even if you went to all the trouble of obtaining a G licence on the strength of your Australian licence, it could be debatable whether or not you could then obtain an Italian licence on the strength of your G licence as you would not be a citizen of the UK. (Latest information is that the reciprocity arrangements by Italy with 19 countries, mainly in Europe, have been revised.)

Another aspect. If, say, you lived in Indonesia (there is reciprocity between Indonesia and the USA) but could not pass the necessary exams to qualify for an Indonesian licence but you made a trip to the USA. Being "smart", you might whilst there sit for the USA multi-choice exam and qualify to obtain a USA licence. So you return back home and say, "Please I want my local licence and here is my USA licence". You might or might not succeed, you might or might not be found out later on and then the trouble would start, not only for you but all others after you.

Incidentally, since photo copies of licences can be "doctored", you can understand why some licensing administrations insist on seeing your actual licence or a copy of it properly certified by the licensing administration which issued it.

OTHER NEWS

Botswana now issues amateur licences using the prefix A22 and Sao Tome uses the prefix S92 (S92AA-S92ZZZ).

According to data in an article appearing in Region 1 Newsletter of February 1980 there were 30,034 amateur radio stations in the USSR, of which 3,629 were collectives, 17,234 individual short-wave and 9,111 ultra short-wave. From the same source it is learnt that in West Germany new technical regulations have been issued designed, inter alia, for some protection for operators of transmitters against unjustified claims from listeners and viewers. Minimum usable field strengths on the antenna of a receiver are set out, for example on VHF and TV ranges the effective antenna input at the receiver must be kept above 42-55 dB/uV. Also set out are the passive interference behaviour of receivers themselves. These new regulations come into force 1-7-1981 and the values given are regarded as somewhat low.

Prefixes in East Germany are now in the series Y21A to Y49Z, Y61A-Y69Z and Y91AA-Y99ZZ. Y21AA to Y29ZZ are for individual licensees.

The Cayman Radio Society (CRS) and the Fiji Association of Radio Amateurs (FARA) have been admitted as the 106th and 107th members of IARU. The number of amateurs radio stations in Japan 31-9-1979 was 414,918. New radio regulations, similar to those in New Zealand, have come into force in Western Samoa. Visitors to 5W1 can obtain an amateur licence provided they bring with them their original licence and a photo copy of it, apply formally and pay T12 (about $13.50). Reg. 3 News February 1980.

The Canadian Radio Regulations were, as stated, changed from 28th February. VEs have lost 420-430 MHz but still have 430-450 MHz, a new VE amateur band for A3 and F3 has been created at 902-928 MHz, a licensed amateur may operate radio-controlled models on certain bands and certain other amendments. Canada's largest amateur Convention (the RSO) will be held in Toronto 3rd to 5th October, 1980.

In a long letter received from Peter Strauss in South Africa he mentioned that "guest" licences are now issued by South Africa for visitors as a special concession. This, as usual, excludes Novice grade licences as there is no such grade in South Africa. The call sign will be the visitor's own home call /ZS (or ——/ZR for limited licensees 2m and up). He also mentions that the Australian licensing patterns are being used in various countries in South Africa. See also AR March 1980, page 43. A late report (from R1 News) has it that in Kenya all amateur Tx equipment must now receive type approval as well as any alteriations thereto.

Australian amateur licensees proposing overseas visits and requiring overseas licensing details should write to the Executive Office, Box 150, Toorak, Vic. 3142, with a stamped, self-addressed envelope for reply. Details for various countries are gradually accumulating and further information is always most welcome.

10 MHz BAND

According to the IARU Liaison Officer, DU1JE, of the Philippino Amateur Radio Association, the Philippine administration has agreed to release the 10.1 to 10.15 MHz band to Filippino amateurs on 1-1-1982. The Society is also negotiating for the release of the 220 to 225 MHz band even though this is not a Region 3 allocation for the amateur service.

The IARU Region 1 Executive Committee recommends that the 10.1-10.15 MHz band be used for CW communications only. Reg. 1 News, June 1980.

10m BEACON HONG KONG

According to an announcement by the Hong Kong Amateur Radio Transmitting Society the Society's 10 metre beacon will be in operation from late May 1980. The call sign will be VS6HK, frequency 28.290 MHz, 10W DC input, omni-directional ground plane antenna and located on Cape D'Aquilar, on Hong Kong Island.

Here is a list of beacons operating or shortly to commence operations on 28 MHz:—

28.205	DL0IGI	28.247	EA2HB
28.207	WD4MSN	28.257	DK0TE
28.210	3B8MS	28.274	ZS6PW
28.125	GB3SX	28.277	DF0AAB
28.220	5B4CY	28.280	YV5AYV
28.230	ZL2MHF	28.284	VP8SB
28.235	VP9BA	28.290	VS6HK
28.237	LA5TEN	28.888	W6IRT
28.240	OA4CK	28.894	WD9GOE
28.245	A9XC	28.992	DL0NF

The frequencies 28.260, 28.265 and 28.270 have been reserved for Australian beacons of which one, in VK5, is understood to be operative. ■

MAGAZINE REVIEW

Roy Hartkopf VK3AOH

(G) General. (C) Constructional. (P) Practical without detailed constructional information. (T) Theoretical. (N) Of particular interest to the novice.

CQ April 1980
The AMSAT Oscar 9 Satellite (G).

QST February 1980
VHF-UHF 3 Band Mobile Antenna (C). The Geneva Story (WARC 79) (G).

BREAK IN April 1980
Six Metre Bandpass Filter (C).

CQ May 1980
High Gain Antenna for 420 MHz (C).

HAM RADIO March 1980
Auto Product Detection of Double Sideband (GT). LED Tuning Indicator for RTTY (C). Logarithmic Detector (G).

QST May 1980
Circular Polarisation and Oscar (TP). Increasing Receiver Dynamic Range (TG). Nor Gate Break In (N). AMSAT Oscar Phase III (G).

QST April 1980
Ionospheric Radar (and the "Woodpecker") (G) (recommended reading). Adjustable Gain Microphone Amplifier (GN). The Balun (GN). Semi-Automatic Antenna Tuner (G). FDX — A Challenge Accepted (AF). Beginners Look at Op Amps (N).

HAM RADIO April 1980
FCC Study Guide (G). QRP 40 Metre Transeiver (GC).

HAM RADIO May 1980
11th Annual Antenna Design Issue.

BREAK IN May 1980
Scanner for IC22S (P). Solar Disturbances (G). ■

QSP

OTHRs

An article by W6QYT in QST April 1980 gives some details of a US "over-the-horizon-radar" known as CONUS OTHB still in the experimental stage. The radar is located in Maine with antenna arrays about 4000 feet long with an average transmitter power of approximately 1 megawatt up to 24 hours a day in the present operating frequency range of 6.7 to 22 MHz. The radar is not authorised to operate in the amateur and some other bands and is permitted elsewhere on a non-interference basis. Separate transmitting and receiving sites are employed so that the transmitter can radiate a continuous signal which is FM-modulated or "chirped" for range resolution. The Russian OTHR (woodpecker) signals consist of millisecond-length pulses at a rate of 10 per second which, the article states, do not stay very long on any given frequency. On the other hand the US OTHR will sound on an AM Rx mode like power-line hum from 20 to 60 Hz. Any reports by amateurs would be welcomed by the US Air Force which has set up a special board of QRM experts as overall interference co-ordinator. A number of other low-powered US experimental radars (WARF, MADRE, White House) have been operated for a number of years with practically no reports of interference. ■

BUYING OR SELLING GEAR?

HAMADS

MAKE IT HAPPEN FAST

YOU and DX

G. (Nick) Nichols VK6XI
6 Briar Place, Ferndale, WA 6155.

Having been licensed only 20 months, I feel unqualified to write this column, however AR wasn't exactly swamped with offers; hi! One moment though, how do you qualify? I at least feel any DXer must primarily be a patient listener and for that at least I'm well equipped. My shack consists of an ICOM 701 but far more importantly I have a good home-brewed multi-element quad array with four elements on 15 and 20 interlaced with 6 on 10 on a 31 foot boom at sixty feet.

Before we go any further please don't think arrays of this size are a prerequisite for DXing, they are not, but **patience** and the **ability to listen** most definitely are.

This column must, due to printing deadlines, contain for the most part information of DX which may well have been and gone from our bands before it reaches you. Seldom do we get information early enough for you, the reader, to take advantage of it, however we all no doubt get a feeling of satisfaction when one of those "rare" ones rates a mention and you managed to work it.

I wonder how often you also consider that a station you worked should have rated a mention but was overlooked? **Well the solution is in your hands.** Much of this column is made up of information passed on by correspondence, on-air QSOs and of course a good deal of patient listening. Make a sked, pick up a pen or the phone and make these articles more informative.

From Allan VK2AIR comes the disturbing news that 9L1K is quoting him as Southern Hemisphere QSL Manager. **THIS IS NOT SO.** Allen has gone to great lengths to obtain logs from this station but all correspondence has gone unanswered, while OE3KD has been named as NH QSL Manager (no QTH can be found for him either). Allen would, needless to say, appreciate any additional information on this operation and **no more cards please.**

For those wondering about the legitimacy of the **ZL6IW** station on 20 metres, it is in fact an official intruder watch and action call sign. The station operator has fluent Russian as an attribute and is doing a sterling job shifting Russian trawler operators from our 20 metre segment.

Merelyn (SWL20118) contributed this month with a list of log entries for the last couple of months, all stations were heard in the novice band segments and many fall into the category of rare, to summarise 181 countries, 39 zones all heard on a long wire. Here's a prefix extract — A7, A9, A35, C21, FH0, FR0, Gloriosa, FW, HZ, JT, JW, OY, PZ, TF, TU, ZL2 Chatham, 6W8 and 9G1. For the series DXer there is obviously something to be learnt from the list, be a patient listener.

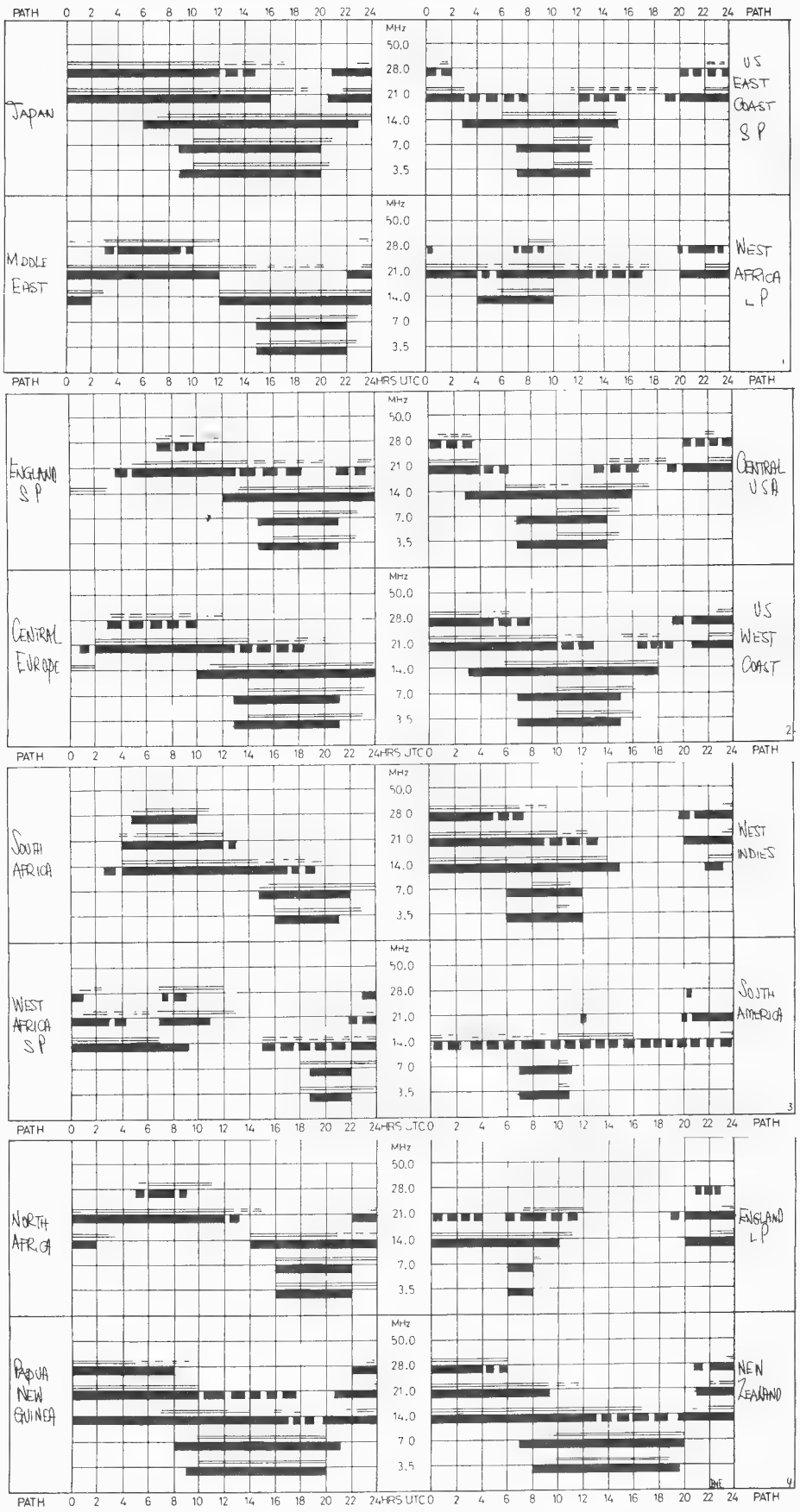
Heard on the bands recently were the following rather dubious and at times downright obnoxious "events". The novice abusing in no uncertain terms a C21 station for forgetting to call him from a list; the practice of "tail-ending" pile-ups has been refined to such an art (??) that the pile-ups can last upward of four minutes with three or four stations all obviously able to hear each other vying for the title "tail end Charlie" — such a pity the DX station got sick of it and closed down and many good mannered stations missed out on a QSO; trying to convince a TL8 that he wanted a net control when he had clearly stated he couldn't clearly read the prospective "organiser" — don't think any further comment is necessary!!

ON THE BANDS

10 metres has been patchy with some good openings into the African continent, **TR8DX, TL8WH, TL8CR, 9G1AP** and **7X2AC** appearing regularly; propagation in this direction should continue to improve during the winter months. For those still needing zone 23, both **JT1KAI** and **J20DJT** have been fairly regular around 28.490. Those needing the Maldives will be pleased to know that Norm **8Q7AV** and his son Romesh **8Q7AZ** have both been licensed recently and are active, particularly on 10. Norm has indicated that he prefers QSOs rather

IONOSPHERIC PREDICTIONS

Len Poynter VK3BYE



than report exchanges; they'll both be there for a long time, so please accede to their wishes.

15 metres, good long path openings into Europe most afternoons.

20 metres is the usual hive of activity with **5W1CR, 5W1BP, FW0DD (CW), 3B6CF** Agalega **FB8ZW** and many more worthy of mention but too numerous to list here.

40 metres has had its moments, with plenty of Ws whilst on 80. **ZS6BNS** and **ZS5SF** were heard and worked early in the morning (2100 GMT) by a VK6 novice; Europe has also been heard at good strength and heralds good conditions for the months.

QTHs YOU MAY HAVE MISSED

TR8DX — via F5VU.
5W1CR — via ZL1BCG.
FW0DD — via VE3ODX.
FB8ZW — via F6CUI.
3B6CF — via 3B8CF.
K6LPL/KH5, WA2F1J/KH5 — via home calls.
8Q7AV and AZ — via Four Winds, Mali, Republic of Maldives.
C5ACR — via PO Box 281, Bathurst, The Gambia.
TL8WH — W5RU.
TL8CR — YO9WL.

73s de Nick. ■

CONTESTS

Wally Watkins VK2DEW
Box 1065, Orange 2800

August

9/10	REMEMBRANCE DAY CONTEST
9/10	EUROPEAN CW CONTEST
16/17	SEANET PHONE CONTEST
16	QLF ZL CONTEST (LOTS OF FUN)
16/17	SARTG RTTY CONTEST
23/24	ALL ASIAN CW CONTEST

September

13/14	EUROPEAN PHONE CONTEST
13/14	ITALIAN 10 METRE CONTEST
20/21	SCANDINAVIAN CW
27-28	SCANDINAVIAN PHONE

October

4/5	VK/ZL/OCEANIA PHONE
11-12	VK/ZL/OCEANIA CW
18-19	JAMBOREE ON THE AIR
25-26	CQ WW DX PHONE CONTEST

November

9	CZECHOSLOVAKIAN CONTEST
8-9	EUROPEAN RTTY CONTEST
29-30	CQ WW DX CW CONTEST

The ZL QLF contest rules may be obtained from "Break-In".

THE 21st ALL ASIAN DX CONTEST

CW SECTION

The purpose of this contest is to enhance the activity of radio amateurs in Asia and to establish as many contacts as possible during the contest periods between Asian and non-Asian stations.

1. CONTEST PERIOD

CW: 48 hours from 0000 GMT August 23, 1980, to 2400 GMT August 24, 1980.

2. BANDS

Amateur bands under 30 MHz.

3. ENTRY CLASSIFICATIONS

(1) Single operator, 1.9 MHz band (CW only).
(2) Single operator, 3.5 MHz band.
(3) Single operator, 7 MHz band.
(4) Single operator, 14 MHz band.
(5) Single operator, 21 MHz band.
(6) Single operator, 28 MHz band.
(7) Single operator, Multi-band.
(8) Multi-operator, Multi-band.

4. CONTEST CALL

For non-Asian stations:
(a) Phone — "CQ Asia".
(b) CW — "CQ AA".

5. EXCHANGE

(1) For OM stations: RS(T) report plus two figures denoting operator's age.
(2) For YL stations: RS(T) report plus two figures "00 (zero zero)".

6. POINT AND MULTIPLIER

(1) For Asian stations:
(a) Point: Perfect contact with non-Asian stations will be scored as follows:
1.9 MHz band: 3 points.
3.5/3.8 MHz: 2 points.
Other bands: 1 point.
(b) Multiplier: The number of different countries in the world worked on each band. According to the DXCC countries list.

(2) For non-Asian stations:
(a) Point: Perfect contact with Asian stations (excluding US auxiliary military radio stations in the Far East, Japan: KA stations) will be counted as follows:
1.9 MHz band: 3 points.
3.5/3.8 MHz bands: 2 points.
Other bands: 1 point.
(b) Multiplier: The number of different Asian Prefixes worked on each band. According to the WPX rules.

(3) JD1 stations:
(a) JD1 stations on Ogasawara (Bonin and Volcano) Islands belong to Asia.
(b) JD1 stations on Minamitori Shima (Marcus) Island belong to Oceania.

(4) Contacts among Asian stations and among non-Asian stations will neither count as a point nor multiplier.

7. SCORING

(The sum of the contact points on each band) x (The sum of the multipliers on each band).

8. AWARDS

(1) For both phone and CW, certfiicates will be awarded to those having the highest score in each entry in proportion to the number of participants from each country and also those from each call area in the United States.
(a) The number of participants under 10: Award only to the highest scorer.
(b) From 11 to 20: Award up to the runner-up.
(c) From 21 to 30: Award up to the top third.
(d) From 31 or more: Award up to the top fifth.

(2) The highest scorer in each Continent of the single operator multi-band entry will receive a medal and certificate from the Minister of Posts and Telecommunications of Japan.

(3) The highest scorer of the multi-operator multi-band entry in each Continent will receive a medal.

9. REPORTING

Both log and summary sheet must arrive in JARL, PO Box 377, Tokyo Central, Japan, on or before the following dates:—
(a) Phone: September 30, 1980.
(b) CW: September 30, 1980.

10. DISQUALIFICATION

(1) Violation of the contest rules.
(2) False statement in the report.
(3) Taking points from duplicate contacts on the same band in excess of 2 per cent by the total.

11. ANNOUNCEMENT OF THE RESULT

(1) Phone: About February 1981.
(2) CW: About April 1981.

12. COUNTRIES LIST OF ASIA

A4, A5, A6, A7, A9, AP, BV, BY, CR9, EP, HL/HM, HS, HZ/7Z, JA-JR, JD1 (Ogasawara Is.), JD1 (Okino tori I.), JT, JY, OD, S2, TA, UA/UK/UV/UW9-0, UD6/UK6C .D. K., UF6/UK6F. O. Q. V., UG6/UK6G, UH8/UK8H, UI8/UK8A-G.I.L.O.T-Z., UJ8/UK8J.R., UL7/UK7, UM8/UK8M.N., VS6, VS9M/8Q, VU, VU (Andaman and Nicobar Is.), VU (Laccadive I.), XU, XV, 3W, XW, XZ, YA, YI, YK, ZC4/5B4, 1S (Spratly Is.), 4S, 4W, 4X/4Z, 7O (S. Yemen), 7O (Kamaran Is.), 8Z4, 9K, 9M2 (West Malaysia), 9N, 9V (Singapore), (Abu Ail).

You may have contest results by enclosing one IRC and SAE with your log. ■

QSL?

For those looking for that are QSL, calling in on the following nets may prove useful.

Family Hour:
W7PHO: 21.345, 0001Z daily; 14.225, 0130Z daily.

Arabian Nights:
JY3ZH: 14.250, 0430Z Friday morning.

P29JS:
P29JS: 14.220, 0630Z daily.

Pacific DX:
VK3PA: 14.265, 0600Z Friday morning; VK2CX: 14.265, 0600Z Tuesday morning.

Caribbean Pacific:
VP2/8P6: 14.170, 1030Z daily.

Ten Metre:
DK2OC: 28.750, 1200Z daily.

Canadians Overseas:
VS6CZ: 14.160, 1400Z daily.

Family Hour:
W7PHO: 14.225, 1430Z daily.

DX to DX:
WB8ZJW: 21.280, 1700Z Monday, Wednesday, Friday.

French DX:
21.170, 1730Z daily; 14.120, 1830Z daily.

Africana:
W6BJS: 21.355, 1800Z daily.

FOR INFORMATION ONLY

Canad-X:
VE3EUP, VE3FRA: 14.173, 1600Z Sunday, except major SSB contests. ■

A Call to all holders of a

NOVICE LICENCE

Now you have joined the ranks of Amateur Radio, why not extend your activities?

THE WIRELESS INSTITUTE OF AUSTRALIA
(N.S.W. DIVISION)

conducts a Bridging Correspondence Course for the AOCP and LAOCP Examinations.

Throughout the Course, your papers are checked and commented upon to lead you to a SUCCESSFUL CONCLUSION.

For further details write to:

THE COURSE SUPERVISOR, W.I.A.
P.O. BOX 123,
ST. LEONARDS, N.S.W. 2065

AMATEUR OPERATOR'S HANDBOOK — 1978
MAGPUBS
P.O. Box 150, Toorak, Vic. 3142
NO AMATEUR STATION SHOULD BE WITHOUT ONE.

The Intruder Watch

21 MHz AMATEUR BAND?

During the month of May harmful interference has left this band in a useless condition most evenings. Due to pulse jammers, i.e. "woodpeckery" and "motor bike", along with A9, F1 and A0 signals it is becoming impossible to have even a local QSO.

Answer yourselves one small question: Why should I turn my set off in disgust when with very little time and effort I could help to rid the band of intruders. Jot down any details with bearings where possible and forward to your State Intruder Watch Co-Ordinator.

If you happen to be in a Division that does not have an IW Co-Ordinator, call in on **3540 MHz Thursday, 1030Z,** and **make your report** or post to **PO Box 156, Healesville 3777.**

Graeme VK3NXI, Federal Co-Ordinator. ■

AWARDS COLUMN

Bill Verrall VK5WV
7 Lilac Avenue, Flinders Park, SA 5025

AUSTRALIAN RAILWAYS AWARD

This certificate is being offered by a group of railway workers/employees of railways in Australia for contacts with railway employees or retired railways employees who are amateur radio operators and charter members of the award. The rules of the award are:—

1. CONTACTS MUST BE MADE with 6 award holders, 3 of which must be Charter Members, i.e. all contacts may be with Charter Members.
2. The minimum of 3 Charter Members must be from different States.
3. Contacts may be made on any mode, any band, but cross band contacts are not permitted.
4. Contacts with Charter Members are worth 5 points each and contacts with award holders are worth 2 points each towards the "WHISTLE STOP AWARD", which will be available shortly.
5. To obtain the "WHISTLE STOP AWARD" applicants must possess the basic award plus 50 points.
6. Claims for the award are to be submitted on a list showing the date, time, band, mode, station worked, signal reports, name and location of the station worked. QSL cards are not required.
7. The cost of the basic award is $3.00 and the cost of further awards is to be determined.
8. Applications, together with the list of stations worked and the fee, should be forwarded to:—

   Awards Manager,
   Jack Thomas VK3NTR,
   1 Stevens Crescent, Ararat, Vic. 3377.

DESCRIPTION

The award measures 290 mm x 225 mm, printed on high quality white paper with an illustration of a steam train (sorry, I am not familiar with the class number as I am not a train buff, but can remember seeing this machine several times in my younger (?) days) in light blue and all printing is in dark blue.

NETT FREQUENCY

Stations wishing to qualify for the award will find several Charter Members on 3610 kHz, Sundays at 1030 GMT.

BRISBANE NORTH RADIO CLUB AWARD

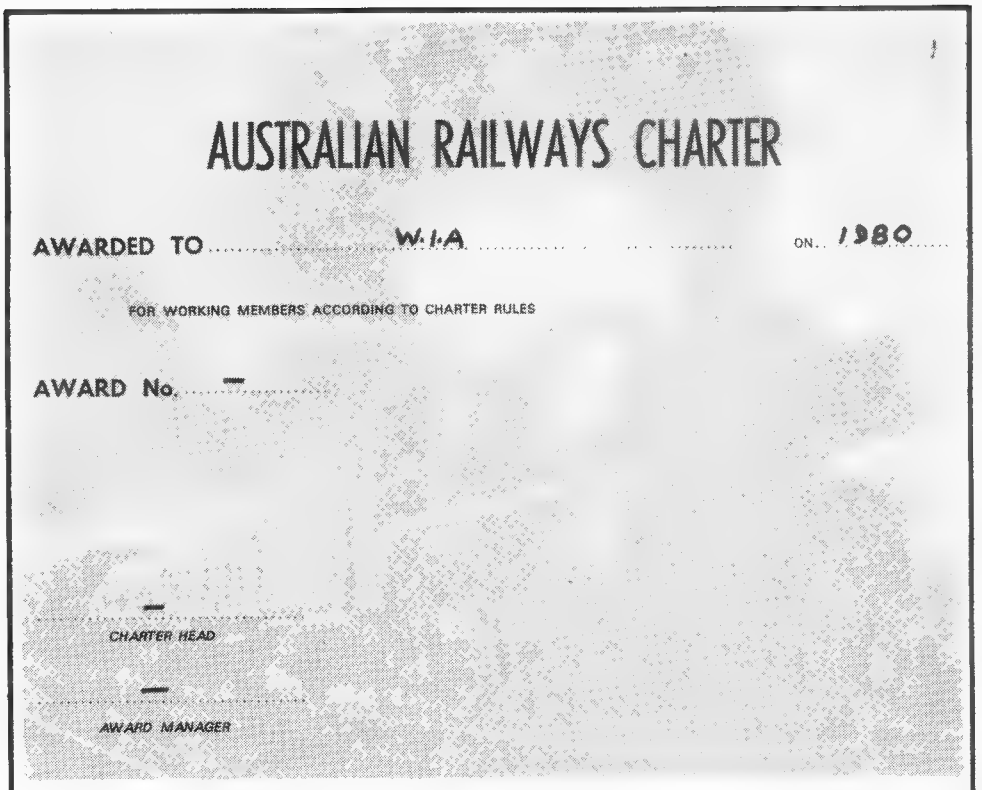
The Brisbane North Radio Club, as the name suggests, is primarily for radio enthusiasts living on the north side of the Brisbane River. Meetings are held twice monthly at the Hooper Centre, Kuren Street, Chermside. An award is now available for contacting Club members and the design closely follows that of the Club motif.

1. For stations located in Australia (VKs 1-8), contacts are required with 10 Club members.
2. For all overseas stations (including VK0 and VK9), contacts are required with 5 Club members.
3. Contacts with the Club station VK4WIN count as 2 contacts and this station may be found on 28420 kHz each Monday at 0900Z. BNRC members may also be found on the same frequency on Sundays after the WIA news call-back session.
4. The award is aavilable also to SWLs both in VK and overseas.
5. Contacts may be made on any mode, any band, but cross band contacts are not permitted.
6. Log details only are required. Do not send QSLs.
7. The cost of the award is $1.00 or 3 IRCs for an airmail reply.
8. Applications, together with the list of stations worked/heard, should be forwarded to:—

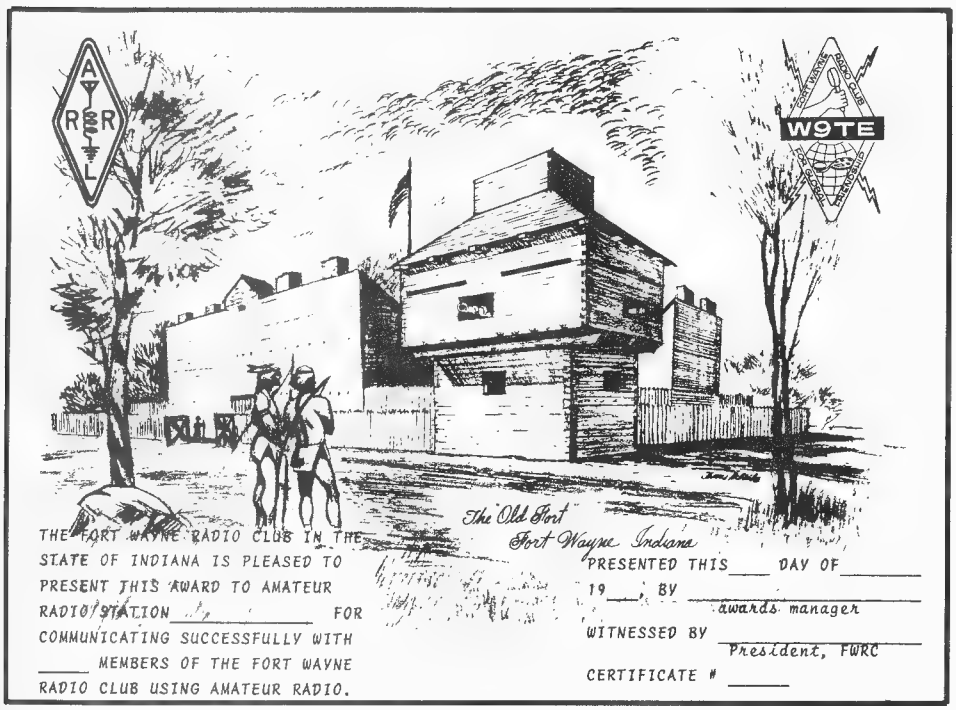
   Awards Manager,
   P. W. J. Parsons VK4NJQ,
   PO Box 242, Alderley, Qld. 4051.

DESCRIPTION

The award measures 250 mm x 215 mm.



THE BRISBANE NORTH
RADIO CLUB
Presents This Award No.....
TO.....CALL SIGN.....ON.....198.....
AS PROOF THAT THE REQUIRED NUMBER OF CLUB MEMBERS WERE CONTACTED IN ORDER TO BE ENTITLED TO THIS AWARD
SIGNED THIS DAY.....198.....
MANAGER.....
BRISBANE NORTH RADIO CLUB
BOX 78 CHERMSIDE QUEENSLAND 4032
AUSTRALIA


W9TE
The Old Fort
Fort Wayne Indiana
THE FORT WAYNE RADIO CLUB IN THE STATE OF INDIANA IS PLEASED TO PRESENT THIS AWARD TO AMATEUR RADIO STATION _____ FOR COMMUNICATING SUCCESSFULLY WITH _____ MEMBERS OF THE FORT WAYNE RADIO CLUB USING AMATEUR RADIO.
PRESENTED THIS ___ DAY OF _____
19___, BY _____
awards manager
WITNESSED BY _____
President, FWRC
CERTIFICATE # _____

FORT WAYNE RADIO CLUB CERTIFICATE

REQUIREMENTS

DX stations: 5 contacts with WFRC members.
US stations: 10 contacts with FWRC members.
Local Stations (Allen Co., Indiana, or local FWRC) members: 25 contacts with FWRC members.
Any frequency. Any mode. All stations must be worked after January 1, 1979.

COST

DX: Free (surface mail) or 2 IRCs (airmail).
USA: $1.00.

QUALIFICATION

To qualify for the certificate, send a list of FWRC members you worked giving the following information:—

1. Call,
2. Name,
3. Date worked,
4. Time in GMT (or Zulu or UTC),
5. Band,

to the address given below.

The list must be signed by you and certified to be true by two other hams or an officer in your local radio club. QSL cards may be submitted in lieu of the certified list but sufficient postage must be included for return of QSL cards.

To apply for the WFRC certificate, send your certified list and the appropriate fee to:

Fort Wayne Radio Club,
PO Box 15127,
Fort Wayne, Indiana 46885. ■

AROUND THE TRADE

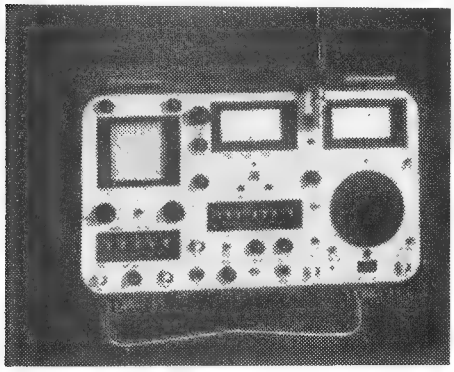
SERVICE MONITOR EXCELS

Since Vicom International released the IFR communications service monitor five months ago, sales have climbed at a staggering rate.

As a combination instrument, the FM 1000S performs power measurement, spectrum analysis, AM, FM, SSB measurement and generation. Dual synthesized tone generators and phase lock BFO make testing SSB a snap.

Vicom's Technical Director, Peter Williams, pointed out that the internal modular construction and diagnostic plugs allows Vicom's service department to offer a three day service turn around.

Information on this instrument is available from Vicom International. Sydney phone (02) 436 2766, Melbourne phone (03) 699 6700. ■



DUAL SCALAR MOVE

Both Scalar (NSW) Pty. Ltd. and Scalar (Qld.) Pty. Ltd. have moved into new premises.

Scalar (NSW) Pty. Ltd. can be found at 328 Kingsgrove Road, Kingsgrove, NSW 2208. The telephone number is (02) 502 2888. Telex AA 27067.

Manager Bert Fraser, together with Mike Kilpatrick and Ron Smith, welcome existing and prospective clients to their new spacious premises. Good parking is available for those wishing to avail themselves of Scalar's technical services, or take advantage of the improved stock holding.

Scalar (Qld.) Pty. Ltd.'s manager, Brian Robinson, advises that their brand new factory and warehouse is located at 8 Ferry Road, West End, Qld. 4101. The new premises will provide improved technical services and greater manufacturing capability.

Good stocks of Scalar's standard range of UHF/VHF and CB mobiles and base station antennas are available. Brian, Terry O'Meara and Ron Bayton welcome any enquiries. Telephone 44 8024. Telex AA 43007.

Both Scalar (NSW) and Scalar (Qld.) represent Scalar Industries Pty. Ltd., Scalar Distributors Pty. Ltd. and Scalar RFI Pty. Ltd. in their respective States and can provide answers and literature for any queries concerning products available from those companies. ■

LEADER FUNCTION SWEEP/AM GENERATOR

Leader's LFG-1300 function sweep/AM generator, which has a frequency range from 0.002 Hz to 2 MHz in eight ranges, features an internal and external 1000 : 1 sweep range (linear or logarithmic), sine, square, pulse, triangle sawtooth and TTL outputs, a built-in 70 dB stepped attenuator (10 dB steps), external AM/FM inputs, a rugged metal housing and a convenient control panel layout.

Accuracy: 3 per cent of reading plus 3 per cent of full scale (0.02-200,000 Hz), 5 per cent of reading plus 3 per cent of full scale (200,000 Hz-2 MHz). TTL output fan out: 20 TTL. Linear or log sweep rate: 20 mS (50 Hz)-5S (0.2 Hz) continuously variable. Ext. sweep output for oscilloscope: 0-10V. Output impedance: 50 ohms ± 5 per cent. Output level: 0-20V p-p (open circuit). Power source: AC 100/117/200/234V, 50-60 Hz. Dimensions 10 (W) x 5 (H) x 10 (D) in. ■

THE RADIO AMATEUR'S CONVERSATION GUIDE

A most useful adjunct for working the DX station not proficient in English. Good also for contests.

$9.00 brings you a copy, post paid.

MAGPUBS

P.O. Box 150, Toorak, Vic. 3142

BOOK REVIEW

"Weekend Projects for the Radio Amateur. Published by ARRL 1979. $US3.50 outside the USA. Our copy from the publishers.

This 60 page volume, published in the familiar QST format, is described as "written for the electronics hobbyist interested in constructing low-cost amateur radio equipment while investing a minimum of time. Volume 1 in a series . . . (it) supplies the builder with schematic diagrams and helpful suggestions for the construction of a pre-amplifier (432 MHz), noise blanker, transmatch, 160-metre converter, small transmitters (80 and 40 metres CW), amplifier (100W on 1296 MHz), external VFO (5 to 5.5 MHz), plus various test equipment and amateur radio accessories. All . . . can be completely assembled within hours or a few days."

The test equipment section includes a transistor tester, oscilloscope calibrator, simple bridges, even a sweep generator (to 1 MHz), filters, switches, timers, power supplies, oscillators, and sundry other items. All in all, the book is quite a mine of information, and a powerful incentive for even the faint-hearted home-brewer to make a start, aware that the task will not be so time-demanding it might never be finished!

The front cover has an intriguing colour illustration of a converter under construction. Maybe intended for the VLF band, the item is not described anywhere in the text. Perhaps, to whet one's appetite, it may be in Volume 2, which, if as good as Volume 1, will also be an excellent investment.

VK3ABP. ■

QSP

ANOTHER CHEMICAL HAZARD

"A potentially deadly threat exists in many ham shacks due to the PCB, the potent cancer-causing chemical widely used as a high voltage insulator" until banned recently. "Polychlorinated biphenyls (e.g. Pyranol) have been widely used in the manufacture of capacitors and transformers since the early 1930s. There is no danger so long as seals are intact."—Ham Radio May 1980. ■

SUPPORT OUR ADVERTISERS

LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

29 Andaman St., Jamboree Heights, Qld. 4074.
28/4/80.

The Editor,
Dear Sir,
I would like to make a proposal via this column which I hope will solve a problem with the use of FSK ident for beacon transmitters. As it seems one half of the listeners said beacons always tune to the wrong side of the frequency, and decode "inverted" ident, then this should help them. I suggest that each alternate ident be the inverse of the previous one, then after two ident periods everyone will know the legit call. This can be easily done via inverting TTL, etc., and should be incorporated into every further FSK Ident scheme and keyer built.

Thanking you,
Ian Morrison VK2YNM. ■

8/40 Terrace Rd., Dulwich Hill, NSW 2203.
10/5/80.

The Editor.
Dear Sir,
I am writing to you in regard to modifications printed in Amateur Radio Action (issues 7 and 8, vol. 2).

The transceiver in question is the Philips FM-321 70 cm amateur transceiver. The modification was for channel expansion and a scanning facility.

As you are probably aware, the circuitry of the FM-321 is almost identical to that of the Philips UHF CB counterpart, the FM-320. I am concerned that these modifications will find their way into the wrong hands, particularly CBers who may expand the channels from the legal 40 to 80 or, with more difficulty, to 100. More importantly, CBers could modify their FM-320s to cover 70 cm. The same applies to modifications for 11m to 10m conversions and 80m transverters for 11m.

In short, I believe that modifications should be ONLY permitted in a magazine that could not fall into the wrong hands, such as the WIA journal, which is obtainable only through WIA membership.

I would like to see comments from the intruder watch co-ordinator any and other amateurs who are in agreement with me

Yours faithfully,
J. Bush (Assoc member WIA).

EDITOR'S NOTE

Most amateur magazines, including AR, are circulated to public libraries, technical schools, clubs, and even some CB groups. Do we therefore delete all such articles in case they might fall into the "wrong hands"? In my opinion, if a CBer can understand what has been written, and even successfully modify his equipment to the specifications printed, he is more than likely two-thirds of the way to becoming an amateur anyway — which is what we want.—VK3UV. ■

Victorian Disabled Citizens' Association,
1 Balfour St., Doncaster 3108.
Phone: 848 3356.
1-6-80.

The Editor.
Dear Sir,

RADIO AMATEURS' GROUP VK3APU

The Radio Amateurs' Group is conducting a Commonwealth-wide appeal on behalf of all physically disabled amateurs and SWLs who until now have been largely forgotten.

Our activities are much the same as the United Kingdom Group — The Radio Amateur Invalid and Bedfast Club. We provide social, recreational activities, novice classes for the disabled SWL, contests, field days, films. Our specialist volunteers for home maintenance and repair jobs are always available.

The VK3APU net on 3575 MHz, Monday/Thursday nights at 0200 hours GMT provides a means where visually disabled and physically disabled amateurs/SWLs can pool their knowledge, skills and spare components, benefit from each other's experience.

Most of the disabled amateurs and SWLs receive a pension so we have started a store of USEFUL component parts, equipment either donated or purchased, be made available to members at little or no cost, as needed, whenever possible, e.g. ex store, test instruments and Tx-Rx library. Membership fees as low as possible to associates (non-disabled volunteers/supporters) who undertake to help physically disabled members. Fee waived for members in financial straits, e.g. pensioners.

The Radio Amateurs' Group depends entirely on revenue from donations from supporters. Registration with the State Government hospital division of the Department of Health makes us a charitable body, all donations over $2.00 are tax deductible, legacies and bequests are free from estate and probate duty. Our aims are to provide an activity therapy centre, first aid room, common dining/room, fully equipped amateur shack/classroom workshop, enclosed heated swimming pool, single and double motel type units, tariff to be charged for accommodation. All amenities will be available to country and interstate visitors.

The appeal has the voluntary support of the Victorian Jaycees, all donations received with the exception of printing costs go to the Association.

The appeal will be opened by the Lord Mayor of Melbourne for the 19th and 20th of July, 1980.

We ask all amateurs and SWLs to support this appeal and make life more rewarding for the visually disabled and the wheelchair mobileers.

It is a refreshing feeling knowing what you love to do and that what you are doing is making so many disabled amateurs and SWLs happy.

73.
Ted Wilks VK3UU,
Lindsay Sykes VK3APU,
Activities Officers. ■

9 Albert Street, Queanbeyan, NSW 2620
26-5-80.

The Editor,
Dear Sir,
The following are extracts from a letter rather too long to publish in full:—

I, and I guess many other amateurs, are very incensed at the "snide" remark on page 39, photo 1, of AR May 1980. The last two lines: Many of us have not the facilities to erect beams and so I feel sure you don't know too much about long wire antennas. My experience covers radio (wireless as it was known then) over 50 years as a naval radio operator, where long wire antennas were always a winner, even during the last war, when I erected many long wire antennas, where possibly thousands of men owed their lives to wireless transmissions. Even today I have perfect faith which cannot be shaken from a properly tuned antenna both for reception and transmission. My antenna is a single wire (7/029) inverted "L" tilted (an amateur phrase you may not be aware of) up about 45 ft. over the roof of my house to 20 ft. shack end and facing NW the shack end to SE over the roof. I have also installed a 5 in. copper ball on the far end (very little known to many other amateurs). This ball was used by Marconi in his experiments and proved a winner, as it did to me, raising my signals to the UK from 3-4 to 5-8.9

Your attention is drawn to page 594 of the Radio Amateur Hand Book 1974, in which it says it is not "UNCOMMON" to find a long wire antenna outperforming a beam antenna in DX contacts, etc. This (it goes on to say) is because it can respond to a variety of incoming wave angles (and can radiate a signal in a like manner), which **is not** the case with a **well designed beam antenna.**

I believe an apology should be forthcoming to all long wire users, mobile and portable, too.

Yours sincerely.
K. W. Harris VK2NOJ.

The remark was not intended to be derogatory, merely a jocular cost comparison.—Ed. ■

C/o Cowell PO, SA.
18/4/80.

The Editor,
Dear Sir,
Having been a member of the WIA for a number of years and enjoyed all the privileges this seems to give me, I feel I must let you know how I feel or **"bust".**

I just opened my April issue and under the heading "QSP — Outlook for the Future" you stated that you were very disappointed about the re-allocation of Channel "0". What I feel is that, as I am a country member, really all I get out of being a member of the WIA is the secure knowledge that they will look after the ham bands or at least lobby for them, but all I can see so far is a lot of talk and no action. What about the six metre operators trying to work overseas? Surely being members as well, shouldn't they be allowed to follow their hobby. It seems that the "CB" boys have really shown the WIA what can be done. Couldn't we follow their lines? Possibly then we might even get back 50 MHz section. How often does one hear really good DX down there on 50 MHz and not able to do anything about it?

Might it not be even possible to have an arrangement which the ZLs have, and that is to work 50 MHz when the local TV is not on. Even that would be something. Having got that off my chest, I can now say I will still remain one of the faithful members, but a sad disillusioned one, who is very disappointed with the WIA

Yours sincerely,
Gary Hambling VK5AS. ■

RTTY NEWS

It is now over three years since the RTTY group was formed in Sydney; since then we have grown and become the Australian National Amateur Radio Teleprinter Society with over 550 members. Our main aim has been to service our members and help them acquire the skills associated with RTTY. Some of the members we have never heard from nor, in the main, do we know they exist, except every year they pay their subs and so are still on the list. This is fine and we are pleased that they are happy with the Society, because if they were not they would either complain or resign. To assist our members, the Society has produced kits for a demodulator, modulator (tone generators) bandpass filters and various other bits and pieces of equipment associated with the RTTY mode.

As has been our custom we are always investigating ways and means of updating the RTTY mode, both on the reception and the transmission side of things. Recently we have been looking at the transmission of ASCII on the various bands. It IS legal to use ASCII on the air. The regulations state that ASCII may be used with any internationally recognised speed code and shift. This is a fairly broad statement, and really does not give any indication on what to use. Basically ASCII is not a communication mode, but is an interchange of intelligence between computers. We feel that the regulations need further interpretation, but in the meantime we are attempting to assess the various speeds and shifts to try and give some indication as to the best for each band. Primarily for the HF bands, ASCII is not a viable means of information transfer, as with the number of components in each letter/figure it is possible that a small burst of static or noise will erase a number of letters or even a word or two, even at the slowest speed of 110 bauds. When attempting to transfer at a faster rate you will need perfect conditions at both ends to achieve any kind of accuracy. In the commercial field there have been numerous tests carried out to ascertain the accuracy of information interchange and it has been agreed that the most accurate and fastest speed is 50 bauds BAUDOT. But this is not the answer we are looking for. We would like to know

the error rate which would be acceptable on the amateur bands. This of course leads us to the point as to where to use ASCII — do we use it in among the BAUDOT signals? This would cause some confusion to all, and what speed do we use? And of course what shift? The faster we send the wider the shift we will need, because if we use, for example, 1200 bauds then the 170 Hz shift would be useless or relatively so, mainly because we would not have the rise time available in that shift needed to give accurate digital transfer. Again the regulations state that for RTTY the shift shall not be greater than 850 Hz. Therefore it would appear on the surface this is the widest we can go. But even 850 Hz shift at 1200 bauds still presents some difficulties, and it may be better to go to 1200 Hz shift. Unfortunately if we use this kind of shift on HF bands we will be taking up a lot of space and therefore causing problems to others. Should we have a separate frequency area for ASCII? It's worth thinking about! On VHF it is an entirely different matter, as we do not suffer from the noise problems we have on HF. With a wider band width on our receivers at VHF it is possible to use ASCII at faster speeds and wider shift and still maintain accuracy. Of course we have shorter paths to send ASCII over, therefore it would be possible to use 9200 bauds at 1200 Hz shift and still maintain an accurate transfer. Then we have the chap who works VHF and also HF, would he have to have a multi-speed/shift set of equipment? Or would it be possible to settle for a standard speed and shift? If one were to assume that the 110 baud rate were to be adopted and the 170 Hz shift were also to be adopted as the standard for all bands, then most of the present equipment in use (modulators, demodulators, etc.) will still be able to be used for the ASCII mode, whereas if the standards were to be set up at say 1200 bauds and 1200 Hz shift there would be problems with some of the present equipment, and there would have to be a certain amount of rebuilding of gear. There would then be the problem of the HF bands where the error rate would be astronomical. We are not making the decisions, rather we are trying to ascertain what those interested in ASCII are thinking and what they would prefer.

While this article would appear to be mainly involved with ASCII, we do not **all** use ASCII. Some use RTTY as a communication mode, and it is good to get on the air and type to other people. Most people use the excuse of not being able to type for not getting on the air. We all could not type in the beginning and we all learnt by practising. More speed is required with typing than by using the keys, and as you cannot get practice by listening, get on the air and make a noise. You will find that most of the chaps are very helpful to the "new" operators.

Early in April the Sydney chaps were very lucky in meeting Colin 9M2CR and his wife Pat, who were in Sydney for a few days from their QTH home in Malaysia. After a drive around the Blue Mountains they then met some of the RTTY fraternity. Colin and Pat were looked after by VK2EW, VK2SG and others. Colin returned to Port Dickson, Malaysia, on the 7th April, and we are sure that we will be hearing his big signal on the air again very soon.

The Australian National Amateur Radio Teleprinter Society have a news broadcast every Sunday at 0030Z (1030 EST) on the frequencies of 7045 kHz, 14090 kHz and 146.6 MHz. This broadcast is repeated at 0930Z (1930 EST) on the frequencies of 3545 kHz and 146.6 MHz. The news broadcast is also repeated on VHF in South Australia, Victoria, Northern Territory, and it is believed in Western Australia at times to suit local commitments.

Several points to ponder. RTTY is generally heard around 3545 kHz, 7045 kHz, 14090 kHz, 21090 kHz and 28090 kHz, as well as 146.6 MHz. On all the HF bands these frequencies may be plus or minus 10 kHz, and as we only use about 20 kHz of each band, please try to keep these frequencies clear. We try to keep clear of the CW segments of the bands, so please return the compliment. Not all fast RTTY stations are intruders, some fellows can type at 60 words per minute, so just because you hear a fast RTTY station around the above frequencies, do not assume it must be an intruder and jam it. Most of the RTTY stations are capable of receiving through single tone QRM, and if you do jam a station you may be spoiling someone else's fun, and I am sure that you would not like someone to jam your CW or SSB QSO. It is also possible that an RTTY station is certainly better equipped to assess a RTTY station and is certainly better equipped to do any jamming which may be necessary in a section of the band. Most can debug the intruder or replay their own transmission, which confuses the station considerably.

Finally, if you have any questions that you would like answered on the RTTY mode, contact Box 860, Crows Nest, Sydney, and we will be happy to answer them for you. We are not the NSW RTTY group but the Australian RTTY Society, and to be the Australian Society we need to know some Australian news, so please send some and we will use it, either in the news broadcasts, the magazine or even in these notes.

Hope to see you again soon.

de Sugar George. ■

SILENT KEYS

It is with deep regret that we record the passing of —

Mr. F. H. A. McCLYMONT	VK3AYR
Mr. J. H. STEPHEN	VK5JS
Mr. F. W. HEEPS	VK3ADX
Mr. P. R. NORMAN	VK5NPN
Mr. R. WILKINS	VK2WQ
Mr. V. J. McMILLAN	VK2AWN
Mr. K. SKULIMOWSKI	VK2NUP
Mr. R. A. FOORD	L50503
Mr. A. E. BRIDGE	VK3AEB
Mr. J. H. W. WHITE	VK6UG
Mr. J. R. FISK	W1HR
Mr. F. N. LEVERIETT	VK2ADE
Mr. R. H. R. LINDSAY	VK5NRZ

OBITUARY

FRANK HEEPS VK3ADX

Mr. Frank Heeps VK3ADX passed away May 19th, 1980, after a short illness. He became interested in amateur radio in 1932 and was licensed in 1935.

Frank served in World War II as a radio operator and was an ardent CW man. He was keen on the building of model warships. In amateur radio the use of low power transmitters was his other interest. He mainly used the 14 meg. spectrum with a dipole.

WM. F. SIEVERS VK3CB. ■

KEITH PETERS VK3AKP

We were all saddened to hear of the death of Mr. Keith Peters VK3AKP, which occurred in Stawell recently. Keith gave five years service in the RAAF as a wireless operator and later as a radio technician he saw service in Australia and the Islands.

After the war he joined the amateur ranks and also conducted a Radio and TV Service of his own, which he carried on until his untimely death.

He took an active part in all WIA activities and his help was greatly appreciated by all members of the Western Zone. Keith was active on all bands, but was extra keen on the DX bands, having nightly skeds with friends in the UK. His gear was something to be admired by all those privileged to see it, a lot was home-brew with a very professional touch. Antenna system the last word in perfection. Main antenna 110 ft. with rotating beams, smaller one for higher frequencies, also with fingertip control.

W. J. KINSELLA VK3AKW. ■

TERRY TATHAM VK2TQ

It is with very deep regret that I record the passing of another of our good friends and amateurs, Terry Tatham VK2TQ, during one of his all too frequent visits to hospital.

Terry passed away on the 14th May — the end of a battle lasting some twenty-five years, since contracting polio in the early fifties.

He was first licensed around 1956 and was present when VK2-WI Dural was opened.

Terry was a quadriplegic, having very little movement in one hand, and confined to a motorised wheelchair during the day, and sleeping in a large respirator machine at night. Every breath he took he literally had to make. Terry had spent some seventeen years of his comparatively young life in hospital.

Having first met him some ten years ago, along with his most charming wife Hendra, and during those years I, and a number of other amateurs in Sydney, formed a very deep and lasting friendship with Terry, and never once did I hear him complain and enlarge about his handicap. He was an incredible man. His pursuit of knowledge — both electronic and in other fields such as becoming a licensed valuer and auctioneer — and an almost photographic memory, allowed him to join in and discuss most topics in a knowledgable and lucid style. He did, however, manage a reasonable amount of construction work and had a well equipped workshop.

His greatest achievement and one that will be a monument to him is the beautiful half complete thirty-foot long cruiser being built in his back yard. He organised every detail, every piece of wood, nail, screw and drop of glue that went into this exquisiteliy built craft. Whilst employing people to do the work — it was certainly Terry's knowledge and total perseverance that created this masterpiece.

Many of us found Terry to be an inspiration. He was active to the last, running a hand-held 2 metre rig in hospital. Amateur radio was a very large and appreciated part of his daily programme, a man who did not suffer fools and could give back better than he received.

The esteem in which Terry was held was shown when many well known amateurs were present to pay their last respects.

To Hendra, our heartfelt and deepest sympathy.

STEPHEN KUHL VK2ZSK. ■

VICTOR (VIC) JAMES McMILLAN VK2AWN

Vic passed away on June 8, 1980, aged 66 years.

He was an electrical engineer, and his training encompassed a wide spectrum, including electronics and structural engineering.

He gained his AOCP in 1950. The writer wishes to pay tribute to the kindly, unassuming help, both theoretical and practical, given by him to many of his fellow amateurs, who will mourn his passing.

His work had to do with design of large transformers for public instrumentalities. He was employed by Crompton Parkinson for 38 years, and later by Westinghouse for six years prior to his retirement in 1975.

Vic was a bachelor and throughout his life was a quiet and generous contributor to many good causes, one of which was the financial support of an orphaned child living in a Third World country. He also donated in the interest of animal welfare.

His period in retirement was, sadly, a short one, and for the last two years of his life he did not enjoy good health.

W. L. HAYES VK2AJL. ■

HAMADS

- Eight lines free to all WIA members. $9 per 3 cm for non-members.
- Copy in typescript please or in block letters to P.O. Box 150, Toorak, Vic. 3142.
- Repeats may be charged at full rates.
- Closing date: 1st day of the month preceding publication. Cancellations received after about 12th of the month cannot be processed.
- QTHR means address is correct as set out in the WIA 1979 Call Book.

FOR SALE

Txcvr, Drake TR4C, excellent cond., with noise blanker fitted and with 240V AC or 12V DC power supply, $550; or with both supplies, $600. Alf Chandler VK3LC, QTHR. Ph. (03) 99 5344.

Kenwood TS520D Txcvr with Dynamic PTT mic. and Dynamic desk mic. for VOX, 10m 3 el. beam, 12 ft. boom with adjustable spacing and element lengths, G5RV ant. complete, all in good cond., station clearance, the lot $500. VK2BDB, QTHR. Ph. (02) 546 2163 Blakehurst.

IC701 with AC supply, IC22-S, both avbolutely as new, beams 204BA 20m, 4 el., 6m 5 el., 2m 8 el., 13.8V 12 amp DC supply. Ph. (03) 240 1231, 509 8637 AH.

MuHi 800D 2m FM Txcvr., 25W, synthesised (see EA Sept. 1978 for review), $300; 25W 2m linear amp. for use with IC202, $30; VK2ZYM, QTHR. Ph. (02) 44 6980.

Complete "Novice Station" Halicrafter SX115 and HT 32, exc. cond., $500. Write to M. Walsh VK4NJC, C/- Railway Station, Eidsvold 4627. Ph. Eidsvold 17 Bus.

FT901DM with SP901 speaker and YO148 desk mic., complete in orig. packing, $1385, ONO; TS820 in very good cond., $850; Drake TR4C Txcvr with AC-4C power supply and 34-PNB n.b. with spares, RV-4C remote VFO, complete in orig. packing, $485, ONO; linear amplifier Alpha 77DX, pair of 8877s ceramic/metal triods, G/G in output, tunable 1.8-30 MHz continuous POA. Greg VK3BIB, QTHR.

Yaesu FT101B AC/DC, mic., CW filter fitted, complete in carton with handbook, low hours, exc. cond., $550, ONO; base for mobile mounting still unpacked, $15; mast ex yacht, 39 ft. tapered and hollowed spruce, light can be erected without a gin pole, $30; R210 Rx plus cks, specification and alignment, $85, ONO. Reduction sale, going bush. VK3XZ, QTHR. Ph. (03) 783 1639.

Teletype Mod. 15 Teleprinter, 45-45 bd, syn. motor, $50; 2 mod. 15s, 50 bd, syn. motors, $30 ea.; 1 mod. 14 typing reperf., 50 bd, syn. motor, $20; 1 mod. 14TD governed motor, $20; 110V step down transformer, $15. VK3ZYD, QTHR. Ph. (03) 497 3049 AH.

Yaesu FT620, exc. cond., unmarked, unmodified, Yaesu VC75 VOX/compressor unit, CushCraft 5 el. yagi, Elega mic./phones headset, headphones, $500 the lot; Belcom liner 2, exc. cond., with extra mixer crystals for Oscar working, home-brew regulated PSU/loudspeaker, dual meter SWR bridge, CushCaft 7 el. yagi, $300 the lot; Stolle rotator, good cond., with control bax and cable, 5 section telescopic mast, $75 the pair; Ken KP202, good cond., with leather case and strap, nicad batteries and charger, helical and whip antennae, ch. 40, 50, 2, 4, 6, 8, $135; home-brew 650 MHz counter prescaler, incl. 11C90 prescaler chip, regulated PSU in Horwood case, $30; part complete home-brew 80m transceiver, includes Horwood case with meter, switches, pots, heatsink, 9 MHz filter and crystals, digital frequency readout module, Dick Smith 30W linear amp., all modules complete, have been working in receive mode, requires mounting and interconnecting of modules, $150, ONO. VK3BMA, QTHR. Ph. (03) 62 9755 Bus., (03) 404 2241 AH.

RCA Radiola 18 Model AR936 and Burgin phone console 5 radio, very old, with legs, suit collector, both antiques and of historical value, best offers for both. Ph. (03) 88 6696 after 6 p.m. or weekends.

Mic. Cable, two individually shielded circuits, plus one switching pair in braided outer sheath, 100 yard coil, $25; 50 yds., $13; 25 yds., $7. P. Glick VK3BMG, 15/47 Hanover St., Fitzroy, Vic. 3065. Ph. (03) 419 2516.

Eddystone Transistorised Receiver EC-10, 550 Kc/s to 30 Mc/s, single conversion receiver powered by internal dry cells, includes switchable BFO and AGC, internal speaker, RF and AF gain, in immaculate cond., includes circuit diagram, etc., $100; Teletype model 15 reperforator, complete with all original wiring, fitted with holding magnets and 110V AC motor, no reasonable offer refused; transformer 240 to 100V, had especially made to supply Teletype, rated at 3.5 amps, brand new, never been used, $30. Ph. (03) 368 2472 Bus. hrs., ask for G. Brownrigg.

2650 Mini Computer System, complete with VDU, cassette interface and software, $300, ONO. Enquiries P. Robbins L40776, 11 Lae Cres. Puckapunyal.

FT200 with mic. and ATU, $350. Contact John VK3BKT. Ph. (03) 654 4333, ext. 231, BH.

Uniden 2020 240V AC/12V DC, 80-10m, txcvr., mint cond., realistically priced at $450; Daiwa RF550 speech processor (crystal filter type), $100; both for $500, or exchange for Tandy TRS-80 disk drive. VK6JC, QTHR. Ph. (09) 458 3016.

FT301D with 200W PSU, as new cond., had little use, price complete $900. Ph. (070) 55 6433 or Box 113, Smithfield 4871. VK4NYI.

Collins 32S1 Transmitter with 516F2 AC power supply and speaker unit, 75S1 receiver with 500 CPS, CW filter, all first class units, $700. Ph. (049) 46 7674.

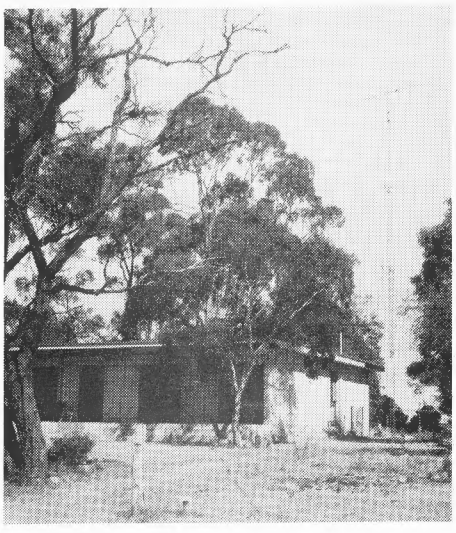
Shack Clearance: Yaesu FT7, $350; AWA FPI xtal locked 80m AM, $50; conv. Johnson Viking 352D, 10m, $150; power supply, 5 amp. cont., $100; desk pwr. mike, as new, $35. Ph. (03) 754 4860.

Yaesu FT401B Txcvr., Yaesu YD-844 mic., Katsumi solid-state speech processor, all mint cond., no mods., spare finals and others, no linear required, 80, 40, 20, 15, 11, 10m, WWV, circuits, manual, $750; Sony tape recorder, 3 speeds, 4 tracks, mono, 120 or 240V AC, mic., 20 tapes, 7 in. and 5 in., reel to reel, as new, $140. VK2PT, QTHR. Ph. (049) 43 1308.

Yaesu FT200 Txcvr, in exc. cond., overhauled and modified by VK5MM, improved 10m band reception, new valves, mic., etc., IC 22A, 2m FM txcvr., repeaters 2 (and reverse), 3, 4, 5, 6, 8, simplex 40, 50, recently checked by dealer. VK3BCG QTHR. Ph. (03) 836 6266, ext. 237, between 0900-1700 hrs.

Uniden 2020 with ext. VFO and spkr., $600; Heathkit SB610 monitorscope, $80; Diawa MC330 mic. compressor, $60; Osker Bloc SWR bridge, $50; 1969 to 1980 AR collection, best offer. VK3AXB. Ph. (054) 39 5458 AH.

Masonry Brick Home, approximately 17 squares, master bedroom, dressing room, ensuite, two other bedrooms with built-in robes, spacious lounge, dining room, family room, kitchen unit with gas cocking, electric hot water service, fully tiled bathroom, masonry block garage, workshop 30 ft. x 16 ft., with rolladoor, tower, etc., set on deep block with barbecue area, natural setting, superb views, $50,000. House of late VK3AKP. All enquiries Grampians Real Estate, 180 Main St., Stawell, Vic. 3380.



Hi-Gain TH3JR, 10-15-20m beam, good cond. Ph. (02) 602 7653.

Kyokutu synthesised 2m FM Txcvr with mobile mount, regulated power supply and magnetic 5/8 wave antenna, perfect cond., $275. Erik Bierre VK2BEK. Ph. (02) 476 5096.

Yaesu FT101E, 160-10m, latest model, modified for novice use, exc. cond., complete with AC and DC power cords, mic., manual and spare set of valves, $750. Contact John Brereton VK5NHB, QTHR.

Icom IC701 with matching PSU and mic., mint cond. orig. cartons, $990. Ian Ampt VK3CH. Ph. (03) 25 6083.

TONO 7000E, brand new, morse CW RTTY reception and transmission, genuine reason for sale. Andy Squires VK3YQX, QTHR. Ph. (053) 48 2061.

Yaesu FT901DM SSB Tcvr., with AM, CW filters factory installed, FV901DM external scanning, 40 memory VFO, spkr., Yaesu mic., all equipment brand new in unopened boxes, $1450 the lot. James VK2JO. Ph. (02) 799 5566 or (02) 36 7756, or GPO Box 5076, Sydney, NSW 2001.

Yaesu FRG-7 comm. Rx, .05 MHz-29.9 MHz, AC/DC, exc. cond., $200. Les L31187, QTHR. Ph. (03) 277 1874.

Kenwood 120S Txcvr., MB-100 mounting bracket, MC-10 mic., $675 the lot; Kenwood PS-30 power supply, 20 amp. 13.8V DC, $170. Contact R. Chapman VK2BYS, QTHR. Ph. (02) 47 1998.

Yaesu FT101B HF Txcvr, plus mic. and SWR bridge, good cond., for quick sale, $475; Yaesu FTV250B, 2m SSB/CW transverter, c/w. low noise pre-amp., matches FT101 series, genuine sale, $195; Yaesu FTV650B 6m SSB/CW transverter, measured 50 watts output, works very well, rush before DX season, $200; Yaesu FR100B amateur band, all mode Rx, 20 to 10m, will cover new WARC freqs., good cond., $145 for quick sale; Eddystone 750 general coverage receiver, good cond., BC band to 32 MHz in 4 bands, $75 to clear. Ring Ken VK3AKK. Ph. (03) 688 9295 Bus.

IC22A Rptr., ch. 2, 4, 6 and 8, simplex 40, 50 and 51, $140; Atlas 210 with n.b. and mobile cradle, $450, ONO; both in perfect cond. VK3ACS, QTHR. Ph. (03) 592 5960.

FTV650 6m Transverter and 5 el. yagi, $120, ONO. VK3ADD. Ph. (03) 791 7801.

WANTED

Ampex 8624 Tube. Particulars to Dr. Dan, VK2ABU, QTHR. Ph. (02) 212 3833 Bus., (02) 328 1261 AH.

Be grateful for information to convert Royce I-632 to amateur bands, or circuit of PLL unt. Information will not be misused. R. Davis L70180, C/-WIA North Branch, Box 275, Launceston 7250, or Ph. (003) 32 4111 Bus.

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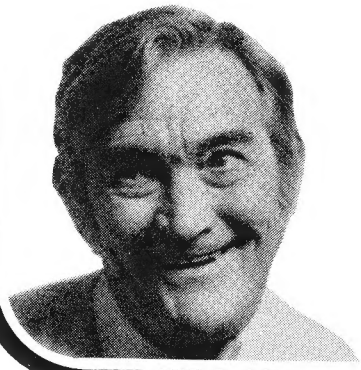

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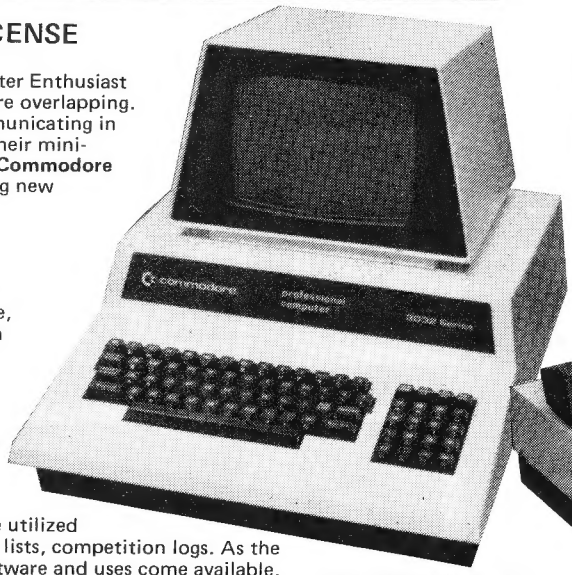

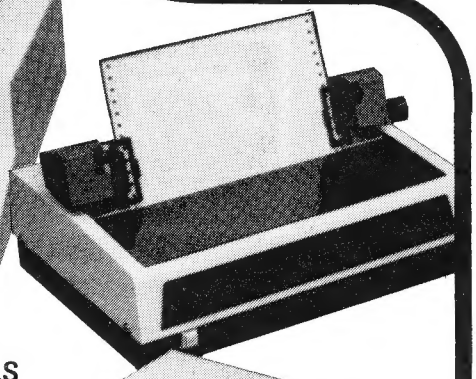

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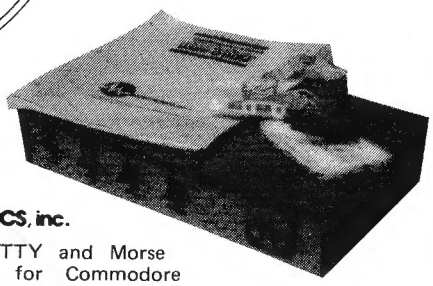

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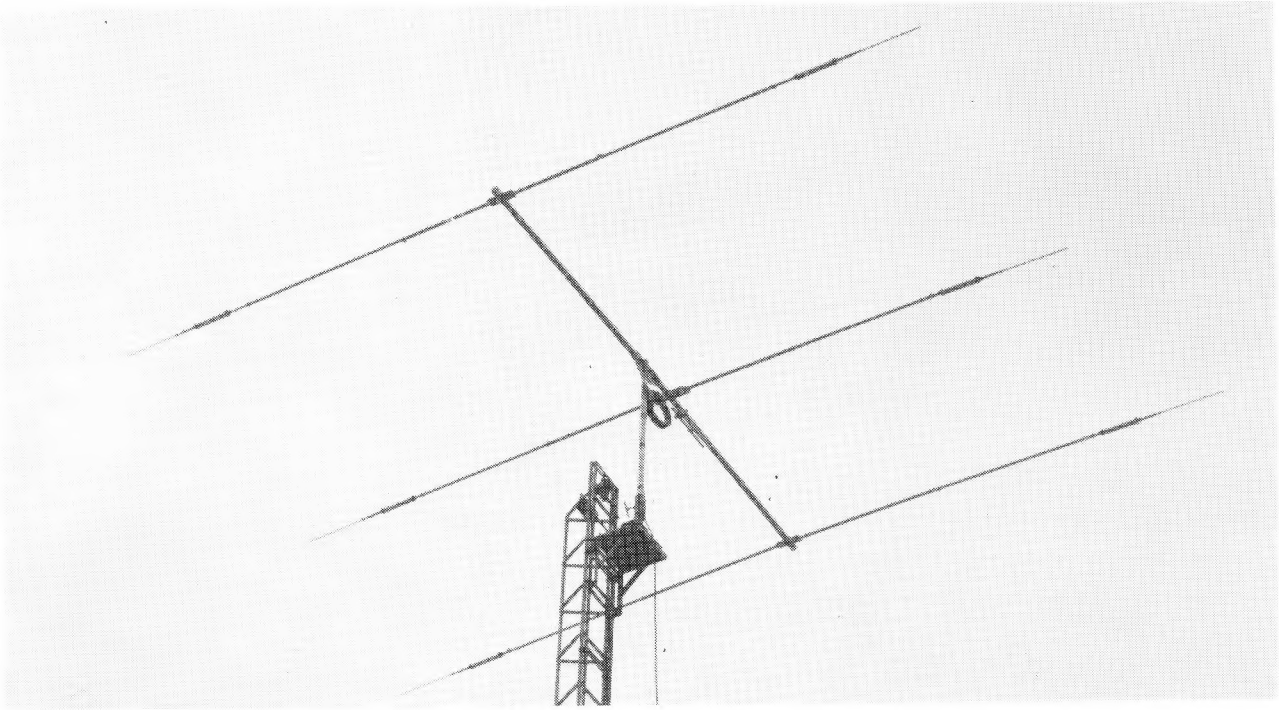

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